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INTRODUCTION AND COLONIZATION OF TWO PARASITES OF THE PINEAPPLE MEALYBUG IN PUERTO RICO

By KENNETH A. BARTLETT *

Mealybug is the most important insect pest of pineapples in Puerto Rico.

The pineapple mealybug, *Pseudococcus brevipes* (Ckll.), is the most serious insect pest of pineapples in Puerto Rico and is widely distributed over the island. It attacks the roots, leaves, and fruits of all varieties thus far grown in the island.

Experiments in the Hawaiian Islands have shown that the mealybug secretes a toxin into the pineapple plant which causes a wilted, flaccid appearance, which varies considerably with the varieties attacked. Where the mealybugs colonize in large numbers, widespread crop failure may be caused in the more susceptible varieties.

In an effort to reduce the population of the mealybug by natural means and thus to supplement cultural and other artificial control measures, the United States Department of Agricltture began the introduction into Puerto Rico of mealybug parasites early in 1936 from field explorations conducted under processing tax funds by the Bureau of Entomology and Plant Quarantine. Further introductions were made during the next year by the Puerto Rico Experiment Station of the same department at Mayagüez. The present paper records these introductions and the rearing, colonization, and recovery of the parasites in the pineapple regions of the island.

Importations of mealybug parasites were made from Brazil and Hawaii.

The first shipments of pineapple mealybug parasites, totaling 47 adults of *Anagyrus coccidivorus* Doz., were received by air express directly from Brazil in 1936. Of these 10 adults were liberated but

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the remainder could not be successfully reared for mass liberation. Further introductions of this species and of another, *Hambletonia pseudococcina* Comp., were made from Brazil and Venezuela via Hawaii in 1937, and these parasites were successfully reared in the laboratory and liberated in Puerto Rico. The shipments coming directly from Brazil were made by D. T. Fullaway, at that time of the Bureau of Entomology and Plant Quarantine. The later shipments from Hawaii were assembled by Mr. Fullaway, then of the Board of Commissioners of Agriculture and Forestry, Territory of Hawaii, cooperating with Walter Carter, Entomologist, Pineapple Experiment Station, University of Hawaii at Honolulu. All of this later material was sent to Puerto Rico by air express, and the mortally en route was negligible. Table 1 is a summary of the introductions of pineapple mealybug parasites made during 1936 and 1937.

TABLE 1—THE INTRODUCTION INTO PUERTO RICO OF TWO PARASITES WHICH ATTACK THE PINEAPPLE MEALYBUG, *PSEUDOCOCCUS BREVIPES*, GIVING DATES, COUNTRIES OF ORIGIN, SPECIES, AND NUMBERS INTRODUCED

Dates	Countries of origin	Species introduced	
		Anagyrus coccidivorus	*Hambletonia pseudococcina*
		Numbers	*Numbers*
February and March 1936	Brazil	47	.....
January 4, 1937	Venezuela[1]	.....	54
May 6, 1937	Brazil[1]	75	.....
Total	.....	122	54

[1] Received via Hawaii.

With the exception of 10 adults of *A. coccidivorus* received in March 1936 all of the parasites were retained in the laboratory for rearing purposes.

Hambletonia pseudococcina **was successfully reared in the laboratory.**

Breeding work with *Hambletonia pseudococcina* was started in January 1937. The first generation reared was not particularly successful, and only two females survived. Fortunately, the species reproduces parthenogenetically and the succeeding generation produced 20 females. Numerous variations in the breeding technique were tried in which various types of cages were employed. Eventually, however, the use of a cage designed and used successfully in Hawaii by Walter Carter (1) was adopted and placed in general usage.

The cage used consisted of a celluloid cylinder with cloth ends which may be tied in about the stalk of the pineapple plant and held

by a support above. Entrance holes and ventilation were provided by openings in the celluloid cylinder. The method followed here was not to infest the fruit by the placing of mealybugs directly on the plant, but to place heavily infested leaf cuttings in the cage, completely surrounding the fruit. From these the young mealybugs readily passed to the fruit and were also carried there by ants, which while not entirely eliminated were never allowed to become numerous. The adult parasites were introduced at the same time as the mealybugs, and many of the mealybugs on the leaves became parasitized and remained settled in position. The parasitized mealybugs on the leaves were removed just prior to expected emergence and the fruit left intact. The fruit which soon became well infested produced some parasites which then proceeded to parasitize the new developing generation of mealybugs, and usually an excellent second generation of parasites thus resulted. The foregoing method eliminated the labor of infesting the fruit by hand, which is time-consuming and difficult to accomplish without injury to the mealybugs. Five adult parasites were usually placed in each cage to start a new generation. This breeding work with *Hambletonia pseudococcina* was discontinued in March 1938 after 6,917 adults had been reared.

Females produced parthenogenetically but males occurred occasionally.

The strain or race of *Hambletonia pseudococcina* received from Hawaii was able to reproduce parthenogenetically but males also occurred. Of the 6,917 adults reared in the laboratory, 40 were males. Mating seemed to take place normally, but the sex ratio among the resulting progeny was apparently no different from that among progeny from parthenogenetic females. Carter (1) states that the Brazilian strain of *H. pseudococcina* is bisexual but that the material he has studied from Colombia and Venezuela reproduced parthenogenetically.

In mating a long courtship was noted to take place. The male took up a position directly in front of the female caressing her with his antennae and preventing any forward movement on her part. As the female turned to escape the male also turned and maintained his position. This procedure continued for several minutes until the male suddenly mounted the female, the period of copulation was always short and was seldom observed to be over 10 seconds.

Oviposition by this parasite has been observed only in half-grown or larger mealybugs. The procedure followed was for the female parasite to crawl about the plant until it had located a suitable

mealybug. This done, the parasite caressed the mealybug for some seconds with its antennae, them quickly reversing its position it backed up, and inserted its ovipositor at the nearest point in the body of the mealybug. Oviposition was noted to continue over a period of time, during which a considerable number of mealybugs could be parasitized by one female.

The females are apparently gravid and able to oviposit at the time of emergence or shortly thereafter; specimens have been reared from mealybugs which were exposed to newly emerged females for a period of only a few hours. At the end of about 18 to 20 days after oviposition the parasitized mealybugs became mummy-like in appearance and in some cases gave the superficial appearance of dipterous puparia. The period from oviposition to initial emergence varied from 24 to 30 days, with the greater majority of the parasites emerging at the end of 26 days.

Three parasites were reared from a single parasitized mealybug.

A group of 25 pineapple mealybug mummies, parasitized by *Hambletonia pseudococcina* was removed from a plant just prior to their expected emergence and placed in separate vials. Parasites emerged from 17 of the isolated mummies: 9 produced a single parasite each, 7 produced 2 parasites each, and 1 produced 3 parasites. In all but one instance the multiple emergence occurred on the same day; in this instance a male, the only one reared from this material, emerged 2 days after a female had emerged from the same mealybug.

Anagyrus coccidivorus **was reared in the laboratory.**

Adults of *Anagyrus coccidivorus* were received from Hawaii in May 6, 1937 and a breeding program was imediately started. "Carter Cages" were used almost exclusively and gave excellent results. The period of development for this species was somewhat shorter than for *Hambletonia,* varying from 19 to 21 days from oviposition to emergence. From May 1937 through December 1938 a total of 9,673 individuals was reared, 4,545 males and 5,128 females. The males usually emerged 1 to 2 days previous to the females. Mating took place readily shortly after the females emerged in the cages or in glass vials.

It is of interest to note that Dozier(2) originally described this species from Haiti as a parasite of *Pseudococcus virgatus* Ckll. The present parasite material, which came from Hawaii, was originally collected in Brazil by D. T. Fullaway from *Pseudococcus brevipes.*

Liberations of pineapple mealybug parasites were made throughout the island.

Liberations of *Hambletonia pseudococcina* and *Anagyrus coccidivorus* were made throughout the pineapple-growing sections of the island as fast as the parasites could be reared. Table 2 which follows summarizes these liberations.

TABLE 2—THE LIBERATION OF *HAMBLETONIA PSEUDOCOCCINA AND ANAGYRUS COCCIDIVORUS* IN PUERTO RICO, GIVING LOCATIONS, DATES, AND NUMBERS LIBERATED

Locations	Dates	Liberations	
		Hambletonia pseudococcina	*Anagyrus coccidivorus*
		Numbers	Numbers
Arecibo	April 1937 to May 1938	[1] 2,116	.....
Arecibo	March 1936	.....	10
Arecibo	June 1937 to July 1938	.....	3,184
Bayamón	November to December 1938	.....	277
Lajas	May to August 1938	.....	3,687
Lajas	April to October 1937	[2] 1,711	.....
Mayagüez	June 1937 to June 1938	345	.....
Corozal	June 1937	950	.....
Toa Alta	July 1937	[3] 1,071	.....
Total		6,193	7,158

[1] Including 13 males.
[2] Including 11 males.
[3] Including 9 males.

***Hambletonia pseudoccocina* has become well established in various localities.**

The first recoveries of *Hambletonia pseudococcina* were made at Lajas on May 7, 1937, when two specimens emerged from mealybugs brought into the laboratory from that locality. Since that time, frequent recoveries have been made; in February 1938, adults were found at Lajas, and one plant examined showed 38 parasitized mealybug mummies to be present; examinations a month later showed that nearly all infested plants harbored parasitized mealybugs. In January 1939, observations showed this parasite to be present in all the fields examined in four separate localities about Lajas, and parasitized mealybugs were readily collected in large numbers throughout this area.

In March 1938, recovery of four adults was made from mealybugs collected at Arecibo. In September 1938, a recovery was made at Las Mesas, Mayagüez. It appears from the foregoing that this species is well established, and it is hoped that some reduction in the pineapple mealybug infestation will result from its introduction.

Anagyrus coccidivorus has not been recovered to date. Liberations will therefore be continued with the expectation that this species may also become established and aid in the control of the pineapple mealybug.

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THE NOMENCLATORIAL STATUS OF THE GENUS DIMERIELLA SPEG.[1]

By RAFAEL A. TORO (1)

Among the genera comprising the family Perisporiaceae of the ascomycetous order Perisporiales, no other genus has been subjected to a wider range of interpretations, than *Dimeriella*. This is one of the genera included by Theissen (**24**) under the general term Dimerinae. The Dimerinae comprises a small number of forms characterized by minute fruiting bodies, light colored, thin, non-hyphopodiate mycelium, and small, two-celled, hyaline or light brown spores. The majority of these forms occur as parasites on leaves or on the mycelium of other fungi and include species formerly assigned to *Dimerosporium* Auct. (not Fuckle).

From a study of the existing literature it is evident that the various authors who have studied species of *Dimeriella* do not have a clear understanding of the genus-concept. For some has had a Sphaeriaceous, Microthyriaceous or Perisporiaceous meaning; while for others, it has been even Capnodiaceous. One wishing to offer a comentary for such discrepancies has only to consider the original description and the species mentioned under it. The vagueness expressed by Spegazzini's (**21**) concept "genus e Dimerosporio excerptum", lay oneself open to a misunderstanding of its true meaning; and a comparative study of the eight species placed originally under *Dimeriella*, leaves no doubt that its author did not have a clear picture of the older genus *Dimerosporuim* Fuckle. In order to illustrate the writer's point the folowing synopsis of the disposition of Spegazzini's species of *Dimeriella*, made by later authors, is presented.

TABLE I—SYSTEMATIC ARRANGEMENT OF THE ORIGINAL SPECIES

Spegazzini's species of *Dimeriella*	Other Author's Disposition	
	Transfer to	Author
dubiosa	*Gibbera-Antennularia*	Von Hohnel
Asterinarum	*Phaeodimeriella*	Theissen
guarapiensis	*Phaeodimeriella*	Theissen
solanicola	*Phaeodimeriella*	Theissen
Elliotti		
coronata	*Acanthostoma*	Theissen
Meyer-Hermani	*Dimerium*	Theissen
hirtula	*Asteromyza*	Theissen and Sydow

(1) Contribution from the Laboratories of Cryptogamic Botany and the Farlow Herbarium, Harvard University No. *170*, and from the Department of Botany and Plant Pathology, College of Agriculture and Mechanic Arts, University of Puerto Rico No. *10*.

As is shown in the above table, only one of the eight species originally placed in the genus has been retained, and this is known only from the description, the specimen having been lost. However, any consideration of the validity of *Dimeriella* rests upon an appreciation of whether the first mentioned, or the first described, species is the type. This necesitates a discussion of the circumstances involving *D. dubiosa* (Speg.) Speg. and *D. hirtula* Speg., respectively.

Dimeriella dubiosa (Speg.) Speg. (Pl. Paraguay, Balansa No. *3539*) was originally described as *Dimerosporium ? dubiosum* Speg. and later it was transferred as the first species under his genus *Dimeriella*. The fungus forms compact, indefinite, black, subiculate, raised ,separate spots on leaves of *Bambos*. The long, densely stromatoid, brown mycelium which is septate, is fastened to the subcuticular layer of the leaf tissue. The few to many round, perithecia or picnidia are brown, ostiolate and adorned at their lower portion, with short, thick, closely septate setae. Paraphyses accompany the cylindrical asci. The two-celled, hyaline spores are elliptico-lanceolate.

Dimeriella hirtula Speg. (Uster, Ipiranga, Brazil) is the first species which has been described and figured. It occurs on leaves of *Baccharis*, where it forms loose colonies. The fruiting bodies are dimidate thyriothecia with thin, septate setae radiating from their lower portions. The mycelium is scanty, brown pellucid, thin and not stromatoid as in *D. dubiosa*. The egg-shaped asci are immersed in a gelatinous paraphysoid body; while the two-celled spores are hyaline at first, becoming light brown with age.

Of the eight original species included under *Dimeriella*, the two just mentioned and five others have been transferred to other genera. *Dimerosporium ? dubiosum* Speg. became *Antennularia ? dubiosa* (Speg.) Th. (**24**). *Dimeriella hirtula* Speg. was made the type of the genus *Asteromyxa* Th. et Syd. (**27**) and the remaining species were placed in the genus *Phaeodimeriella* Speg. and others. Later Theissen & Sydow (**27**: 462) restored the name *Dimeriella* Speg. as a genus of the Perisporiaceae, broadened its concept and selected as its type a different species, *Dimerosporium Cordiae* P. Henn. It is in this last sense that recent authors use the name.

It is altogether evident that there has been expressed three different concepts of *Dimeriella* and, therefore, the validity of the genus is rather doubtful. If the first described species is to be considered as the type, then *Dimeriella* Speg. belongs to the Microthyriaceae and *Asteromyxa* Th. & Syd. becomes a synonym. If on the other hand,

we designate the first species mentioned as the type, the genus becomes a synonym of *Gibbera* Fckl. Theissen (l.c.) in his revision of the genus *Dimerosporium* transferred the species mentioned by Spegazzini to *Antennularia ? dubiosa* (Speg.) Th. with the caption "Ist eine Gibbera-Antennularia". Already v. Hohnel (**9**) has shown that *Antennularia* Reich. is one of the fungi imperfecti representing pycnidial stages of *Coleroa* or *Gibbera*. We have compared Spegazzini's specimen and it agrees with the latter genus. Whether *Dimeriella* Speg. could be accepted as a valid generical name depends on the justification of Theissen and Sydow (l.c.) in selecting a new type. We believe this is contrary to the accepted rules of nomenclature and therefore the name should be discarded. The present species can be distributed among the already existing genera of the ascomycetes.

A consideration of the systematic position of the group to which *Dimeriella* Speg. has been assigned, seems appropriate at this time. The genus has been considered a member of the order Perisporiales, as established by Lindau (**13**). This order consisted of three families, namely: Erysiphaceae, Perisporiaceae and Microthyriaceae. In the light of our present knowledge of these families, it is evident that its author merely regarded the group as a temporary resting place and considered the fructifications as perithecia borne on aerial mycelium. The absence of an evident ostiolum justified their treatment together. Subsequent works on the group, tending to clarify the situation, has thrown much light on the subject.

The Microthyriaceae, on account of their shield-shaped, inverse radiate fruiting bodies were first seggregated by Theissen (**26**) and placed in a new order, the Hemisphaeriales. Furthermore, Theissen and Sydow (l.c.) subdivided the Perisporiaceae of Lindau into three families, Capnodiaceae, Perisporiaceae and Englerulaceae, and together with the Erysiphaceae treated them under the Perisporiales.

The term Perisporiales has been a matter of discussion. The name is based on the genus *Perisporium* Fr. whose type species has been shown to belong to the Imperfecti genus *Crocicreas* by Saccardo (**20**) while Petrak and Sydow (**16**) consider it to be a juvenile stage of a Discomycete. In view of this fact, Gwynne-Vaughan (**8**) has proposed the name *Erysiphales* for the order, basing the proposition on *Erysiphe*, the next oldest genus name. In this she has been followed by Bessey (**4**). However, Fitzpatrick (**5**) has elevated the Erysiphaceae to ordinal rank, restricting the term Erysiphales to this family. Such change is based upon Miller's (**14**) recent studies on the differences in origin of the ascocarps. The Capnodiaceae have been investigated by Arnaud (**3**) and regarded as Sphaeriaceae

related to the Lophiostomataceae. Woronichin (**29**) however, insists that the Capnodiaceae form a well delimited group of ordinal rank for which he proposes the name Capnodiales. All of the genera of the Periosporiacea and Englerulaceae so far investigated have been shown to belong to the Pseudosphaeriaceae or to the Dothidales (**7**) (**19**) (**14**).

This has resulted in a great deal of shifting of the genera originally included in the Perisporiales. This situation caused Petrak (**18**) to say that "weil man heute noch gar nicht weiss, was weine Perisporiazee ist und wie ein Pilz beschaffen sein muss, um als Perisporiazee geten zu konnen." Furthermore, Nannfeldt (**15**) in his very complete discussion of the morphological relationships existing among the Ascomycetes, failed to treat the Perisporiales as such, but remarks in a foot-note "Der Ordnung Perisporiales felht jedlich Existenzberechtigung." Arnaud (**1**) also considers the Perisporiaceae as a 'groupe sans valeur aucune".

The writer's own observations on species of *Meliola* Fr. and of the *Dimeriella,* herein discussed, have convinced him that both these genera do not correspond with the definition of Theisse nand Sydow (l.c. 447) "angiocarpen Askomyceten mit mundunglossen kugeligen Gehäusen". These authors include in the Family Perisporiaceae 19 genera and four additional doubtful ones. Of these *Lasiobotrys* Kunze was studied by v. Hôhnel (**11**), Arnaud (**1**) and Petrak (**17**) and all agree on its exclusion from the Family. Arnaud (**2**) transferred *Parodiopsis* Maubl. and *Perisporina* P. Henn. to his family Pariodiellinacees, while *Chrysomyces* Th. & Syd. and *Piline* Th. are given as synonyms of the former. *Meliola* Fr., *Irene* Th. & Syd. and *Meliolina* Syd. are certainly related to the Dothideales (**1**) (**7**) (**14**). As will be shown in a subsequent paper, the asci are borne in a locule and the fruit body is a stroma. Arnaud (**1**) points out that *Dimerium* Sacc is Sphaeriaceous.

Though natural relationships among the Ascomycetes can only be obtained through studies of their life histories, these are not possible in general classificational work. The taxonomist must depend on the gross morphology of the species in question for its determination. From the few life history studies on this group, certain facts have been obtained which help in correlating characters of asci, paraphyses and spores with the type of development. It has been demonstrated by Killian (**12**), Frey (**6**), Miller (**14**) and others that in the Pseudosphaeriacea the ascogenous hypahe lie from the beginning enclosed in a stromatic tissue and gradually by pressure or

resorption this tissue is pushed away to permit the development of asci. Each ascus is separated from the other by intervening remnants of stromatic tissue which forms elongate, compressed, paraphyses-like threads. When the asci are close together, as in this group, this tissue can be easily mistaken for paraphyses; except for the fact that is fastened above and below to the inner wall of the fruiting body. This is especially evident in young ascocarps.

Correlated with this structure is the arrangement of the asci in a parallel layer standing more or less close together and at the same height. On account of having to push their way thru the tissue and the subsequent formation of the locule, the asci in this group are thick walled, especially so at the apices. This condition causes them to be either ovoid or clavate and their dehiscense is by rupturing of the walls. Certainly they are never thin walled in the main body and slightly thicker at the apex or operculate. However, there is no uniformity in spore size or shape.

The crucial structure in the group is the fruiting body,which, though called a perithecium by most mycologists, it is a stromatic organ of vegetative origin. Miller (l.c.) has demonstrated that the perithecium, the typical structure of the pyrenomycetes, has its origin in the sexual apparatus. It is usually of light color and in the majority of the cases is protected by a stroma. Therefore most of the pyrenomycetes are stromatic. The typical pyrenomycete is well illustrated in Weston's figures of *Loramyces* (**28**). Their asci are elongated, thin walled and separated by free-ending paraphyses. There is an ostiolum lined by short threads called peryphyeses. On the other hand, though the fruiting bodies of our present Perisporiales are globose and perithecium-like, they nevertheless, are the product of special development in the vegetative cells of the mycelium. At the beginning, the fruiting bodies, which v. Hohnel (**10**) calls pseudothecia, are astomous, but with age, the central portion of the apex breaks away giving them the appearance of ostiola. This phenomenon has been a matter of confusion and has lead to the establishment of a number of so-called Sphaeriaceous genera.

According to Arnaud's (**2**) interpretation the species which are at present included in the genus *Dimeriella* and its related genera *Dimerina, Phaeodimeriella* and *Dimerium* show a very close relationship to the group Parodipsidees. However, there are certain features which justify their consideration as distinct genera of this group. This paper discusses only the *Dimeriella* forms, the remaining genera will be discussed later.

The fruit body of the Parodiopsidees consists of a single layer of colored cells. The abundant mycelium is superficial; setae are either present or absent and the ascospores are light brown and two-celled. The principal difference between this group and the present *Dimeriella* lies in the size, color and consistency of the ascocarps. The *Dimeriellas* have very small fruiting bodies which are light or dark brown when young, and more or less fleshy. However, *Parodiopsis ? manihotis* (P. Henn.) Arn. can be regarded as a *Dimeriella* without setae.

As a basis for the separation of *Parodiopsis* Maubl. and *Dimeriella* Auct. (nec. Speg.) the writer is considering the presence of setae, color of the young ascocarps, and the absence of a recognized conidial stage in the latter.

SYSTEMATIC CONSIDERATIONS

As already stated *Dimeriella* Speg. is one of those concept-genera which, on acount of undefiniteness in characterization, has given rise to a variety of meanings, according to the interpretation given to the fundamental genus *Dimerosporium* Fckl. However, this genus is an *Asterina* with a gelatinous dehiscence. The revision of the genus *Dimerosporium* by Theissen (**24**), showed that the species included under it belong to more than half a dozen genera and that *D. veronicae* Fckl., its type, was its only true representative.

From the present study of the *Dimeriellas* the writer has found that they can be separated in two rather distinct genera, i.e., *Lasiostemma* Th. & Syd., related to Arnaud's Paradiopsidees, including most of the species, and *Neohoehniela* Th. & Syd., which shows affinities with the present Capnodiaceae.

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Capnodinula Speg. Physis **4**: 288. 1918.
Pseudoperisporium Toro, Sci. Surv. P. R. 8^2: 42. 1926.

Leaf parasite. Mycelium superficial, thin, brown pellucid, straight, septate, branched, without hyphopdia. Ascocarp globose, somewhat papillate rather small, superficial on the mycelium, adorned with numerous setae arising from the outer, somewhat blackened layer of parenchymatous cells, dehiscence by rupture of the thin, brown apical cells. Asci eight spored, clavate, thick tunicate above, numerous, each one separated by a thin septate, hyaline tissue. Spores two-celled, hyaline at first, becoming olivaceous or yellowish with age. Conidial stage unknown.

Type species: *Lasiostemma melioloides* (B. and C.) Th. & Syd.

In Clements & Shear's "Genera of Fungi" p. 54 and 67 this genus is placed in the Perisporiaceae and also in the Sphaeriaceae. In the first family it lies between *Dimeriella* and *Chaetostigme*, while in the second, it is next to *Apiosporina* from which it differs in the absence of an ostiolum. The first relation is to my mind the right one. In a forthcoming article on the status of the genus *Phaeodimeriella* Speg. the writer considers in extenso, his views on the relationships of *Apiosporina*.

It has already been pointed out why *Dimeriella* Speg. ought to be discarded. Although *Chaetostigme* Syd. antedates *Lasiostemma* Th. & Syd., the former genus was established, with a very meager description, as one of those concept-genera. No type specimen was designated at the time, and its only description was "*Dimeriella* aber mit Paraphysen". Later, while discussing a specimen from New Zealand, on *Lagenophora Billardieri*, Sydow (**22**) takes Berkely and Curtis' species *melioloides*, which had been already assigned as the type of *Lasiostemma*, and makes it the type of *Chaetostigme*. He further remarks that *melioloides*, in the sense of Theissen, is a composite species and that his specimen probably constitutes a distinct one. This observation strenghthens our conclusions that *L. melioloides*, is a collection of well defined and distinct species. Since Sydow selected a species which has already been assigned to a well defined genus we are forced to consider his genus *Chaetostigme* as a synonym. Clements and Shear's recognition of *Chaetostigme* and their selection of another species as its type has no justification.

Capnodinula Speg. is based on *Asterella trichodea* Rehm. which Theissen included as a synonym of *L. melioloides*. Because it differs from the latter in the character of the colonies and color of the spores, the writer considers it here as a distinct species.

The genus *Pseudoperisporium* Toro and along with it, the order Pseudoperisporiales has no right of existence. Miller (l. c.) has already defined an ostiolum, on the light of our present knowledge, and the pore formed by resorption of the apical cells to let escape the mature spores, can not certainly be homologize with the canal in the pyerenomycetes.

As originally indicated *Lasiostemma* differs from *Dimeriella* on the position of the seate. *Dimeriella* species are described as with setae on the lower portion of the ascocarps and these are rather short;

while *Lasiostemma* was supposed to include those *Dimeriellas* with long setae on the upper part of the fruit bodies. That this character is a rather weak one to differentiate among genera is shown by *D. Cordiae* P. Henn. which sometimes has ascocarps with setae above the upper middle part; in *D. coronata* Speg. a great number of the setae are on the lower portion. We are extending the characterization of *Lasiostemma* to include not only those whose setae are on the upper part but also those whose seate are located at any place on the ascocarp as previously stated. Their position and length, however, serve to differentiate between species or group of species.

KEY TO SPECIES

A. Fungus not producing leaf discolorations.
  I. Setae mycelium-like
    a. Setal length about twice the diameter of ascocarp, on Carduaceae.
      1. Setae mostly occuring at the apex of ascocarp.
        " Colonies small, black, smooth 1. *L. melioloides*
        ' Colonies large, brownish-ve- 2. *L. distans*
          lutinous
      2. Setae occuring at any place 3. *L. coronata*
    b. Setal length not exceeding diameter of ascocarp.
      " Spores 10–12 × 4 — 5u, on Borraginacea. 4. *L. cordiicola*
      ' Spores 15–20 × 5 — 7u, on Poaceae 5. *L. disseminata*
  II. Setae spine-like, on Ericaceae. 6. *L. maculosa*
B. Fungus producing reddish discolorations on leaf, on Carduaceae. 7. *L. gnaphali*

1. LASIOSTEMMA MELIOLOIDES (B. & C.) Th. & Syd. Ann. Myc. **15**: 218. 1917.

Asterina melioloides B. & C., Grevillea **4**: 10. 1875.

Meliola baccharidis B. & Rav., Grevillea **4**: 158. 1876.

Dimersporium melioloides (B. & C.) Martin, Journ. Myc. **1**: 146. 1885.

Dimerosporium baccharidis (B. and Rav.) Sacc., Syll. Fung. **1**: 53. 1882.

Dimerosporium melioloides (B. & C.) Ell. & Ev., N. Am. Pyr. **1892**: 32.

Dimerosporium vestitum Earle, Bull. N. Y. Bot. Gard. **2**: 338. 1902.

Dimeriella melioloides (B. & C.) Th. Ann. Myc. **10**: 1. 1912.

Chaetostigme melioloides (B. C.) Syd., Ann. Myc. **22**: 295. 1924.

Spots none; colonies epiphyllous, separate, rarely confluent, more or less round, black, shiny, compact, forming a superficial easily detachable crust, .5–2mm. diam; mycelium not spreading beyond the individual colonies, septate, yellowish-brown, straight, never anastomosing, without hyphopodia, rather scanty, without setae, 3–4μ thick; ascocarps thickly distributed on the colony, astomous at first, later perforating at the apex by disintegration of the weaker cells there, made up of a layer of dark brown polygonal cells, smooth, 80–100μ in diameter; ascocarpic setae at the summit only, sorrounding the pore and oriented toward the leaf surface, 150–200μ long; asci numerous, separated by a thin, hyaline, septate, soon breaking tissue of parenchymatous cells which is attached, above and below, to the inner wall of the ascocarp, clavate, thick-walled, tunicate at the upper portion, sessile or very short pedicellate, 8-spored, 46–50 × 8–11μ; spores mostly biseriate, sometimes triseriate, two-celled, slightly constricted, greenish to light yellow, 9–12 × 2.5—4μ.

TYPE SPECIMEN: In Curtis Herbarium No. *1355.*
DISTRIBUTION: United States (South Carolina to Florida), Bermuda.
MATERIAL EXAMINED: On *Baccharis halamifolia* L.

Curtis Herbarium No. *1355 (Co-type);* Roland Thaxter, No. *2474* and *3831*, Daytona, Fla., Jan. 1898; Anastasio Island, St. Augustine, Fla.; Collected by E. A. Rau, 1885. (In Herbarium N. Y. Bot. Garden.)

On *Baccharis glomerolifera* Pers.

Plants of the Gulf States, Collected by S. M. Tracy, Manatee, Fla. No. *7279;* R. Thaxter, Daytona, Fla. 1898 (In Herb. N. Y. Bot. Garden); G. Nelson, Sebastián, Fla. (In Herb. N. Y. Bot. Garden.)

2. **Lasiostemma distans** (Rehm) comb. nov.
Asterdium distans Rehm, Hedwigia **40**: 157. 1901.
Asterella trichodea Rehm. Ibid. 159.
Capnodinula trichodea (Rehm) Speg. Physis **4**: 288. 1918.
Dimeriella caracaensis Maubl. Bull. Soc. Myc. France **36**: 34. 1920.

Spots none, colonies epiphyllous, round, often confluent but always regular, velutinous, brownish-black, dull, 3–7 mm. across; mycelium superficial, scanty, yellowish, pellucid, septate, branched, about 3 μ thick; fruiting bodies scattered black dull, perforated by a pore which is sorrounded by long, septate, dark brown, setae measuring 200–300μ long, 114μ in diameter; asci ellipsoid, thick tunicate, short pedicellate, separated by a similar tissue as above, two-celled, slightly constricted, upper cell a little wider than the lower, hyaline or dilute brownish, 13–17 × 5–6μ.

TYPE SPECIMEN: H. Patzche No. *2127.*
DISTRIBUTION: South America (Brazil and Ecuador).
ILLUSTRATIONS: G. Arnaud, Les Asterines I. Pl. III as *D. melioloides* B. & C.

MATERIAL EXAMINED: On Composite.
H. Patzxche No. *2127 (type)*. Ule Fungi Amazonici No. *1857*.

On *Baccharis genitillioides* Pers., Theissen Decades Braziliensis No. *238*.

On *Baccharis* sp., A. Maublanc, Fungi Brasiliensis No. *327*, Caraca, Minas Geraes, Sept. 18, 1913.

This species, though occuring on the same host genus as the above species, differs from it in the character of the colonies, the length of the setae and its geographic distribution.

3. **Lasiostemma coronata** (Speg.) comb. nov.
Asteridium coronatum Speg., Anal. Cien. Argentina **26**:18. 1888.
Dimerosporium Puiggarii Speg., Bol. Acad. Nac. Cien. Córdoba **11**:485. 1889.
Asterella Conyzae Pat., Bull. Soc. Myc. France **8**: 127. 1892.
Dimerosporium annulatum Rehm, Hedwigia **35**: 53. 1896.
Asterella longiseta Starb., Bih. K. Svensk. Vet. Akad. Handl. Stockholm **253**: 25. 1899.
Dimeriella horridula Syd., Ann. Myc. **7**: 352. 1909.
Dimeriella longiseta (Starb.) Th., Broteria. **9**: 12. 1910.
Dimeriella Conyzae (Pat.) Th., Ann. Myc. **10**: 183. 1912.
Dimeriella erigeronicola Stev., Trans. Illinois Acad. Sci. **10**: 166. 1917.
Dimeriella claviseta Doidge. Trans. Roy. Soc. South Africa **56**: 717. 1917.
Pseudperisporium erigeronicolum (Stev.) Toro, Sci. Surv. Porto Rico 8^1: 41. 1926.
Chaetostigme erigeronicola (Stev.) Illinois Biol. Monog. 11^2: 169. 1927.
Chaetostigme horridula (Syd.) Clements & Shear, Genera *Fungi* **1930**: 250.

Colonies epiphyllous, forming small, round, hardly distinguishable or larger, concentric, colonies 1–4 mm. in diameter; crusts black, dull, widely scattered; mycelium sinous, septate, yellowish-pellucid, hyaline at the extremities, sometimes anastomosing, 1.5–2.5μ wide; ascocarps black-brown, numerous in each colony, globose, perforated at the apex, composed by one layer of polygonal, parenchymatous cells, 60–115μ in diameter, adorned at the base or lower middle part by 9–15, septate, long clavate, sometimes uncinate, truncate or lobed, setae about 200μ long 2–7μ wide; asci cylindric-clavate, apex tunicate, numerous and separated from each other by long, septate, hyaline, thin strands of pseudoparenchymatous tissue which soon disintegrate,

8-spored; sessile or short pedicellate, 35–55 × 10–20μ; spores conglobate or biseriate, 2-celled, slightly constricted, hyaline at first, yellowish with age, 8–15 × 3–7μ.

The distinguishing character of this species is the arrangement of the individual colonies in concentric rings. Its spore character is very variable, sometimes being definitely two-celled, while others appear as if three septate by the formation of a false septum at one of the cells, thus dividing the spore into three unequal cells. Sometimes the content is granular. The mature spores are yellowish, though this character is not constant. The variability of this species is better expressed in the comments of Theissen (**25**) ". . . In formis modo relatis varii coloris gradus hyalinis flavi viriduli et fusci exhibentur et saepe quidem in aedem matrice".

TYPE SPECIES: B. Balansa Fungi Paraguayensis No. *3925*.
ILLUSTRATIONS: Bih. t. Kongl. Sevenska Vet. Akad. Handl. 25, pl. I fig. 43. Trans. Roy. Soc. South Africa 56: pl. LVII figs. a, b, c.
DISTRIBUTION: South America, South Africa, West Indies.
MATERIAL EXAMINED: On Composite.

B. Balansa, Fungi Paraguayensis, Paraguari, No. *3925*, Aug. 1883. No. *3582*, Caayazu.

On *Bacharis* sp.

Theissen Decades Brasiliensis No. *722*, Sao Paulo, Río Grande do Sul.

On *Leptilon pusillum* (Nutt.) Britton.

Cornell University Explorations of Porto Rico Whetzel, Kern & Toro No. *2637*, Ciales, P. R., July 20, 1924. Fungi of Venezuela, Kern & Toro No. *1709*, Oeumare de la Costa.

On *Senecio* sp.

Puiggari No. *2586*. Apiaphy, San Pablo, Brazil, April 1888.

On *Leptilon bonariensis* (L.) Small.

F. L. Stevens, Puerto Rico Fungi No. *189*.

H. Sydow, Fungi Venezuelani, No. *249* Pto. La Cruz, Jan. 16, 1928.

F. L. Stevens, Fungi British Guiana No. *204*, Fumatumari, July 11, 1922.

On *Leptilon chinense* (Jacq.) Britton.

F. L. Stevens, Puerto Rican Fungi No. *2048*, Quebradillas, P. R.

4. **Lasiostemma cordiicola** (P. Henn.) comb. nov.
Dimerosporium cordiicolum P. Henn., Hedwigia **43**: 355. 1904.
Dimerosporium cordiae P. Henn., Hedwigia **48**: 4. 1908.

Dimeriella cordiae (P. Henn.) Th., Beih. Bot. Cent. **26**: 67. 1912.
Dimerium Stevensii Garman, Mycologia **7**: 337. 1915.
Chaetostigme cordiae (P. Henn.) Stev. Illinois Biol. Monog. **11**: 169. 1927.

Colonies epiphyllous, indistinct, widely spreading mycelium branched, wavy, septate, brown-pellucid, forming a faint pellicle over the leaf surface, without setae or hyphopodia, 2–3μ thick; ascocarps scattered over the mycelium round or somewhat egg-shaped, at the apex with a round pore about 18μ in diameter, dark brown, 60–70μ in diameter; beset at the center of the lower portion by short, septate, entire or toothed, numerous setae 40–50μ long; asci clavate, thick-walled, intersperse by thin, septate, hyaline tissue which soon disintegrates resembling paraphyses, tunicate above, somewhat saccate at the base, sessile or short pedicellate, 8-spored, 30–45 × 14–18μ; spores biseriate or triseriate, somewhat ellipsoid, 2-celled, slightly constricted, hyaline at first, light brown with age, 10–15 × 5–7μ.

Though *Dimeriella Cordiae* (P. Henn.) Th. has been generally accepted by all workers as the proper name for this species, a comparison of the type specimens of *cordiicolum* and *cordiae*, showed that they are indentical, the former name having priority. However, the material on which the species was based is immature and that accounts for the differences encountered by the author of both species. *D. Cordiae* was selected by Theissen and Sydow (l. c.) as the new-type of *Dimeriella* but on the assumption that it contains hyaline spores. Subsequent studies of abundant material from different localities has revealed that the spores are brown. Garman's placement of the Porto Rican material under *Dimerium* illustrates this fact. In its general appearance the species resemble a *Coleroa* or *Gibbera* with superficial mycelium. However, its superficiality and lack of conidial form makes it unlike any of these genera.

TYPE SPECIMENS: E. Ule's Herbarium Brasiliensis No. *2950*.
ILLUSTRATIONS: Illinois Biol. Monog. 11, pl. III, fig. 18; Monog. Univ. of Porto Rico, series B. No. 2, pl. 27, fig. 1–2.
MATERIAL EXAMINED: On *Cordia* sp.

Ule's Herb. Brasilensis No. *2950*, Jurua, Est. Amazonas, Sept. 1901. Steven's Trinidad Fungi, St. Clair No. *892*, Oct. 15, 1912; Port of Spain, No. *863*, Oct. 14, 1912. Plants of Costa Rica, Paul C. Standley, El Limón, No. *48380*, Feb. 20, 1926. Fungi Brasilensis, Putemans No. *640*, Sao Paulo, Feb. 1903. Explorations of Venezuela, Kern & Toro No. *1835*, Monai, May 1934. Chardón & Toro No. *502* and *495*. Road from Turmero, July 9, 1932.

On *Cordia cylindrostachya* R. & S.

Fungi Venezuelani, H. Sydow No. *802*, Antimano, Dec. 12, 1927. Chardón and Toro Explorations of Venezuela No. 754, Los Teques, July 29, 1932. Cornell University, Explorations of Puerto Rico, Whetzel and Olive *611*, Yauco, March 30, 1916.

On *Cordia corymbosa* (L.) G. Don

Porto Rico Fungi, Stevens, No. *934*, College Grounds, Mayagüez; Fungi Venezuelani, H. Sydow, No. *41*, Catia, Dec. 16, 1927. Explorations of Colombia, Chardón, No. *425*, near Buga, June 4, 1929. Herbarium, C. E. Chardón, Whetzel & Olive's Fungi of Puerto Rico, No. 6637, Mayagüez, March 13, 1916; Coamo, August 24, 1920, collected by C. E. Chardón, No. *855*.

On *Cordia microscephalla* H. B. K.

Fungi Venezuelani, H. Sydow, No. *197*, El Limón, Pto. La Cruz, Jan. 9, 1928.

On *Cordia ferruginea* (L.) R. & S.

Explorations of Colombia, Chardón No. *265*, Jamundi, May 15, 1929.

5. **Lasiostemma disseminata** (Sydow) comb. nov.
Dimeriella disseminata Sydow, Ann. Myc. **28**: 66. 1930.

Colonies hypophyllous, forming no spots; mycelium thin, covering large areas of the leaf surface, septate, branched, light brown, 2–4μ thick; fruit bodies widely distributed over the mycelium, round when young, perforated at the apex at maturity and then conic, 75–130μ wide, about 150μ high, adorned at the base with radiating hypha which form a subiculum while from about the center there are one or two rows of long, septate, obtuse setae reaching about 150μ long; asci numerous, clavate, thickly tunicate, sessile or short stipitate, with separating pseudo-parenchymatous tissue, 8-spored 40–65 × 12–18μ; spores sub-biseriate, fusoid, straight or slightly curved, ends round, hyaline at first, olivaceous with age, two-celled, constricted, 14–20 × 5–8.

MATERIAL EXAMINED: On *Lasiacis sorghoidea* (Desv.) Hitch y Chase., Fungi Venezuelani, H. Sydow, No. *260b (Type)*, El Limón, Pto. La Cruz, Jan. 16, 1928.

6. **Lasiostemma maculosa** (Ellis) comb. nov.
Venturia maculosa Ellis in N. Am. Fung. No. 200.
Meliola maculosa Ellis, Bull. Torrey Bot. Club. **8**: 91. 1881.
Dimerosporium Ellisii Sacc., Syll. Fung. **1**: 53. 1882.
Dimeriella maculosa (Ell.) Th., Beih. Bot. Cent. **29**: 37. 1912.

Colonies hypophyllous, numerous, dull black, frequently anastomosing, 8–10 mm., round or irregular; mycelium brown-pellucid, septate, straight, about 3μ wide; ascocarps globose, black, astomous or perforated at the apex, 100–120μ in diameter, setae hair-like, sorrounding the upper portion of fruit bodies, rather thick, dark brown, acute, somewhat twisted or straight, 100–160μ long, 8–10μ wide; asci cylindrical, thick walled, intersperse by hyaline, pseudoparenchymatous tissue, short pedicellate, tunicate in the upper portion, 40–50 × 10–14μ; spores inordinate, light olivaceous, two-celled, slightly constricted, cells unequal, 10–12 × 5–6.

MATERIAL EXAMINED: On *Andromeda* sp.
Ellis North American Fungi No. *200 (Type)*, New Field, N. J. 1878.
DISTRIBUTION: United States; (New Jersey, Mississippi, Michigan).

7. **Lasiostemma Gnaphali** (P. Henn.) comb. nov.
Dinerosporium Gnaphali P. Henn. Hedwigia **41**: 297.
Asterina microtheca Pat. Soc. Myc. France **18**: 301. 1902.

Spots amphigenous, brown, irregular, extending beyond the individual colonies, usually confluent; colonies superficial, round or irregular, 2–4mm. in diameter; mycelium thin, brown pellucid, septate, straight, 3μ wide; ascocarps gregarious, black, small, round, usually perforated at the apex, 70–100μ in diameter, setae-radiating from the base, septate, darker than the mycelium, tips obtuse, 80–123μ long; asci clavate, sessile or short pedicellate, tunicate above, thick-walled throughout, 8-spored, 20–30 × 8–12μ; spores sub-biseriate, 2-celled, fusoid, or clavate, apex acute, slightly constricted, olivaceous, 6–8 × 3μ.

TYPE SPECIES: Putteman's Fungi Sao Paulensis No. *458*.
DISTRIBUTION: South America (Brasil).
MATERIAL EXAMINED: On *Gnaphali* sp.
Fungi Sao Paulensis, Putteman No. *458*, Pedra Branca, Nov 1901.

On *Leucopsis Tweediae* Baker

Patouillard's Herbarium, No. number, Leg. Glaziou, Brasil.

2. NEOHOEHNELIA Th. & Syd. Ann. Myc. **15**: 476. 1917.

This genus is incorporated by the authors among the Capnodiaceae. Its general character and relationships will not be discussed here for such procedure would involve a consideration of the affinities of *Dimerosporina* v. Höhn., *Henningsiomyces* v. Höhn. *Dystychnis* Clem., and other Capnodiaceous genera. Such discussion is outside of the scope of this paper. Mention is only made because the well known

and widely distributed *Dimeriella Olyrae* is a synonym of ***Meliola oligotricha*** Mont, type of the genus. We will refer again to this genus when considering the Capnodiaceae.

8. **Neohoehniela oligotricha** (Mont.) Th. & Syd., Ann. Myc. **15**: 576. 1917.
   Meliola oligotricha Mont., Syll. Crypt. **1856**: 254.
   Dimerosporium oligotrichum (Mont.) Sacc. Syll. Fung. **1**: 54. 1882.
   Dimerium oligotrichum (Mont.) Sacc. Syll. Fung. **17**: 537. 1905.
   Parodiella setulosa P. Henn. Hedwigia **43**: 357. 1905.
   Henningsomyces oligotrichum (Mont.) v. Höhn., Sitz, K. Akad. Wis. Wien. **119**: 460. 1910.
   Pseudoparodia setulosa (P. Henn.) Th. & Syd. Ann. Myc. **15**: 139. 1917.
   Dimerosporina setulosa (P. Henn.) Th. & Syd., Ann. Myc. **15**: 167. 1917.
   Asterina fumagina Dearn & Barth., Mycologia **9**: 349. 1917.
   Dimeriella fumagina (Dearn. & Barth.) Stev. in Stevenson, Journ. Dept. Agric. Porto Rico **2**: 36. 1918.
   Dimeriella Olyrae Stevens, Trans. Illinois Acad. Sci. **10**: 167. 1917.

Colonies epiphyllous, abundant, black dull, round, usually anastomosing, 1–3 mm. in diameter, mycelium dematioid in the vicinity of the fruiting bodies, straight toward the ends, septate, crooked, 3–4μ thick; ascocarps numerous, black, rugulose, astomous with 1–3 straight, septate, obtuse setae; mycelial setae also present, 200–300μ long; asci 8-spored, clavate, tunicate, 50–70 × 25–30μ; spores inordinate, septate, hyaline at first, light yellowish with age, 15–18 × 7–8μ.

TYPE SPECIMEN: Fungi of Cayenne, Leprieur. No number.
ILLUSTRATION: Hedwigia **43**: 358. 1904.
MATERIAL EXAMINED: On *Olyra latifolia* L.
Herbarium of F. v. Höhnel slide collection; Ule Fungi Brasilensis No. *3308*, Tarapoto, Peru; Porto Rican Fungi, Bruce Fink No. *453*, Río Piedras, Nov. 30, 1915; No. *1265*, Dec. 23, 1915, Mayagüez.

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NEW OR LITTLE—KNOWN SPECIES OF WEST INDIAN TIPULIDAE (DIPTERA) IV

By CHARLES P. ALEXANDER *

The third part under the above title appeared in this Journal, vol. XXI, No. 4, October 1937. The present report is based almost entirely on extensive collections of crane-flies that were taken on various West Indian islands, chiefly by Mr. P. J. Darlington, Jr., and by Mr. Marston Bates, and are now preserved in the Museum of Comparative Zoölogy, Cambridge, Mass. The species that were taken on the higher mountains of Haiti and the Dominican Republic proved to be of especial interest and value.

In a preliminary section, I am discussing a small but very interesting collection of these flies that was taken in the island of Dominica, Lesser Antilles, by Mr. Walter H. Hodge, at the present time a student at the Gray Herbarium, Harvard University. The specimens in this latter series are preserved in my personal collection. I wish to express my sincere thanks and indebtedness to Messrs. Bates, Darlington and Hodge, and to Dr. Nathan Banks of the Museum of Comparative Zoölogy, for the privilege of studying this exceptionally interesting series of Tipulidae.

I. Tipulidae from the Island of Dominica

The species herewith recorded appear to be the first that have been taken in Dominica, although rather numerous species are known from St. Vincent. A most interesting general account of conditions in the island is given by Frederick A. Ober, *Camps in the Caribbees* (Edinburgh; David Douglas), pp. 1–366; 1880. Mr. Hodge, collector of the present material has supplied the following notes concerning the localities where the more interesting species were secured.

Morne Trois Pitons: A volcanic peak situated roughly in the center of the island and a peak which has at times been claimed to be higher than the generally accepted tallest peak, Morne Diablotin. According to Dr. Paul Griswold Howes, of Greenwich's Bruce Museum, Trois Pitons is 4,600 feet. The crane-flies were collected on one of the two lesser summits, altitude 4,500 feet, in typical wind-dwarfed, rain-swept cloud forest, the branches of the trees dripping

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with mosses and hepatics and laden with other epiphytes, particularly water-containing Bromeliads. Here the cane-flies (*Tanypremna* ***hodgei*** (sp. n.) occurred in dozens, many mating. The few I managed to pick up I had to stalk after they had alighted beneath the shelter of the leaves. During the summer months, part of the rainy season, the summits of all of Dominica's mountain peaks are almost continually enshrouded by rain clouds. Rainfall near the summits must exceed 300 inches per year.

Hatton Garden Trail: An old Carib footpath running through virgin tropical rain forest from Sylvania Estate, near Trois Pitons, to Hatton Garden Estate on the northeast (windward) coast. Crane-flies were secured by sweeping the vegetation along the Layou River near its source in the neighborhood of the old abandoned Riversdale estate. Altitude approximately 2,000 feet; rainfall about 200 inches. River bed rocky and boulder-filled. Stream turbulent.

Sylvania Estate: Near the base of Trois Pitons (west). Altitude 1,800 feet; rainfall between 175 and 200 inches. Surrounding forests can be called true "rain-forests".

Tanypremna *(Tanypremna)* **hodgei** sp. n.

General coloration of mesonotum dark brown; pleura medium brown, unmarked; halters relatively short, dark brown throughout; legs brownish black, passing into black on all tarsi; wings with a strong brown suffusion, cell *Sc* and the stigma darker brown; cell *1st* M_2 short and wide; abdominal tergites dull black, before mid-length ringed with yellow, the outer segments and hypopygium uniformly black; male hypopygium with the dististyle at base on outer margin produced into a powerful spine.

Male.—Length about 14–15 mm.; wing 11.5–12.5 mm.; antennae 1.4 mm.

Female.—Length about 17–19 mm.; wing 13–14 mm.; antennae 1.4 mm.

Frontal prolongation of head very short, reddish brown; palpi black. Antennae shorter than palpi; basal segments brownish yellow, the outer ones more darkened; basal flagellar segments enlarged, the outer ones linear, with long conspicuous verticils. Head reddish fulvous, variegated with darker on vertex, expecially across the anterior vertex as a more or less continuous band.

Pronotum yellowish brown. Mesonotal praescutum chiefly covered by four dark brown, subnitidous stripes, the intermediate pair separated by a capillary darker vitta, the posterior interspaces scarcely indicated; posterior sclerites of notum dark brown, the sides of

mediotergite a little paler. Pleura medium brown, unmarked. Halteres short, dark brown throughout. Legs with the coxae and trochanters pale brown; femora and tibiae brownish black, the tips somewhat more blackened; all tarsi black. Wings (Fig. 1) with a strong brown suffusion, cell *Sc* and the stigma darker brown; paler streaks in centers of some of the cells, especially in female; veins brownish black. Venation: Sc_1, free tip of Sc_2 and $R_1 + _2$ all relatively close together at wing-margin, the distance between them less than vein $R_1 + _2$ alone; cell *1st* M^2 short and wide, *m-cu* at near two-thirds its lower face; petiole of cell M_1 variable in length, but approximately equal to *m*.

Abdomen elongated; tergites ringed with yellow and dull black, the latter including more than the outer half of the segment, as well as a very narrow darkening at base, restricting the yellow to the outer portion of basal rings; outer segments and hypopygium uniformly black; sternites more yellowish, the posterior borders of the more basal segments broadly brown, passing into black on outer segments. In the female, the yellow color is more obscured and pruinose. Male hypopygium with the outer basal portion of dististyle (Fig. 10, *d*) produced into a strong blackened spine; beak of style on outer margin before apex with one or two small blackened pegs. Ovipositor with valves sclerotized, relatively slender.

Habitat.—Dominica.

Holotype, ♂, Morne Trois Pitons, altitude 4,500 feet, August 15, 1938 (*Hodge*). Allotopotype, ♀. Paratopotypes, ♂ ♂, 1 ♀.

Tanypremna (Tanypremna) hodgei is named in honor of Mr. Walter H. Hodge who collected this important series of Dominican Tipulidae. It is very different from the other species of the typical subgenus that have darkened tarsi, as *I. (I.) carbonipes* Alexander (Ecuador), *I. (I.) fuscitarsis* Alexander (Colombia), *T. (T.) kadeni* Alexander (Venezuela *T. (T.) invaripes* Alexander (Brazil), especially in the coloration of the thoracic notum and pleura, the venation, and the structure of the male hypopygium. The genus hitherto had not been detected in any of the West Indian islands, on the mainland extending from southwestern Mexico southward to southeastern Brazil.

Limonia *(Limonia)* **apicata dominicensis** subsp. n.

Male.—Length about 5 mm.; wing 5.5 mm.

Female.—Length about 7.5 mm.; wing 7 mm.

Characters as in typical *apicata* Alexander (ranging from northern Florida, subspecies *subapicata* Alexander, to Peru, subspecies *na-*

poensis Alexander), differing only in slight hypopygial characters. Male hypopygium with the gonapophyses (Fig. 13) very broadly expanded and compressed, before apex bearing a small spinous point.

Habitat.—Dominica.

Holotype, ♂, Layou River, on Hatton Garden Trail, altitude 2,000 feet, August 16, 1938 (Hodge). Allotype, ♀, Sylvania Estate, altitude 1,800 feet, August 29, 1938 (Hodge).

Limonia (Rhipidia) domestica (Osten Sacken).

Dominica: Marigot, July 1938 (Hodge). Lisdara Estate, altitude 1,800 feet, August 1937 (Hodge).

Limonia (Rhipidia) costalis (Williston).

Dominica: Sylvania Estate, altitude 1,800 feet, August 29, 1938 (Hodge).

Limonia (Geranomyia) cinereinota (Alexander).

Dominica: Layou River, on Hatton Garden Trail, altitude 2,000 feet, August 16, 1938 (Hodge). Hitherto from Greater Antilles; northern South America, south to Paraguay.

Limonia ***(Geranomyia)*** **dominicana** sp. n.

Mesonotal praescutum pale gray, with a broad, yellowish brown, median stripe, the lateral borders of the sclerite broadly dark brown; knobs of halteres dark brown; femora yellow, with a narrow brown subterminal ring; wings yellow, variegated with pale brown, the dark areas at origin of *Rs* and fork of *Sc* barely connected; *Sc* short, Sc_1 ending about opposite one-fourth the length of *Rs;* abdominal segments yellow, narrowly ringed caudally with brown; male hypopygium with the rostral prolongation of ventral dististyle short, with a powerful common tubercle bearing two unusually long curved spines; aedeagus at apex with two conspicuous lobes.

Male.—Length, excluding rostrum, about 7 mm.; wing 6.8 mm.; rostrum about 3 mm.

Rostrum and palpi black, the former elongate. Antennae with scape and pedicel black, flagellum pale brown; flagellar segments oval. Head dark gray, the anterior vertex and a central line back to occiput light gray.

Mesonotal praescutum pale gray, with a broad yellowish brown median stripe that is a little darker in front, on posterior half narrowly delimited by delicate dark margins; lateral praescutal borders broadly and conspicuously dark brown; scutellum and median region

of scutum pale testaceous, the scutal lobes darker, delimited internally by a narrow dark line; postnotum pale. Pleura yellow, variegated with brown, especially on dorsal portion. Halteres with stem pale yellow, knob dark brown. Legs with the coxae yellow, fore pair a trifle darker; trochanters yellow; femora obscure yellow, with a narrow, dark brown, subterminal ring, about equal in extent to the clear yellow apex; remainder of legs obscure yellow, the terminal tarsal segments a little darker. Wings yellow, the costal border more saturated; a conspicuous pale brown pattern, as follows: A series of five costal darkenings, the first at arculus, second at supernumerary crossvein in cell *Sc*, both small; third area larger; at origin of *Rs* and fork of *Sc*, barely interconnected and forming an irregular area; stigma relatively small; fifth darkening small, at end of vein R_3; cord and outer end of cell *1st* M_2 seamed with brown; small marginal dark clouds at ends of veins M_3 and M_4, with larger and more conspicuous ones on veins *Cu, 1st A* and *2nd A;* veins yellow, slightly darker in the clouded areas. Venation: *Sc* relatively short, Sc_1 ending about opposite one-fourth the length of *Rs*, Sc_2 at its tip; cell *1st* M_2 about as long as vein $M_1 + _2$ beyond it; *m-cu* at fork of *M*.

Abdominal segments yellow, narrowly ringed caudally with brown; hypopygium yellow brown. Male hypopygium with the caudal margin of tergite nearly truncate or very feebly emarginate. Ventral dististyle much more extensive than basistyle; rostral prolongation short and stout, more than one-half of its outer margin involved in a large tubercle that bears the two long spines; these latter borne at tip of tubercle, subequal in length, strongly curved, exceeding in length the dorsal dististyle; base of tubercle expanded proximad into a flange; apex of rostrum beyond tubercle very short, only about one-third the length of tubercle. Gonapophyses with mesal-apical lobe blackened, expanded, at apex narrowed into a very short decurved beak. Aedeagus short, at apex with two conspicuous lobes.

Habitat.—Dominica.

Holotype, ♂, Sylvania Estate, altitude 1,800 feet, August 30, 1938 (Hodge).

The most similar described species include *Limonia (Geranomyia) carunculata* Alexander and *L. (G.) deliciosa* Alexander, both of which are readily distinguished by the structure of the male hypopygium.

Limonia ***(Geranomyia)*** **microphaea** sp. n.

Size very small (wing, ♂, less than 5 mm.); general coloration brownish black, unmarked; rostrum elongate, about two-thirds the

length of body; halteres brownish black, the base of stem obscure yellow; wings strongly tinged with brown, stigma darker brown; *Sc* relatively short, Sc_1 ending about opposite one-forth to one-fifth the length of *Rs*; cell 2nd *A* narrow, especially on outer half; abdominal tergites brownish black, basal sternites obscure yellow; hypopygium uniformly blackened; male hypopygium with the ventral dististyle much more extensive than the basistyle; rostral prolongation long and slender, at base with a low common tubercle from the summit of which arise two straight spines of moderate length, these spines shorter than the prolongation; gonapophyses with mesal-apical lobe a short curved black spine.

Male.—Length, excluding rostrum, about 4 mm.; wing 4.8 mm.; rostrum about 2.8 mm.

Rostrum very long, about two-thirds the length of body, black, the distal third of paraglossae paling to brown. Antennae broken. Head dark.

Mesonotum almost uniformly dark brown to brownish black, the surface polished, the humeral region of praescutum a little brightened. Pleura dark brown, the ventral portion of sternopleurite paler. Halteres brownish black, the base of stem obscure yellow. Legs with coxae brownish yellow; trochanters yellow; remainder of legs broken. Wings strongly tinged with brown, cells *C* and *Sc* a trifle darker; stigma oval, darker brown; veins dark brown. Venation: *Sc* relatively short, Sc_1 ending about opposite one-fourth to one-fifth of *Rs*, Sc_2 at its tip; *Rs* relatively long, fully three times the arcuated basal section of R_4+_5; cell *1st* M_2 nearly as long as vein M_1+_2 beyond it; *m-cu* shortly before fork of *M*; cell *2nd A* narrow, especially on outer half.

Abdominal tergites brownish black; basal sternites obscure yellow; hypopygium uniformly blackened. Male hypopygium (Fig. 15) with the caudal margin of tergite with a broad U-shaped notch, the lateral lobes broad. Dorsal dististyle only gently curved, the tip a slender spine. Ventral dististyle large and fleshy, much more extensive than basistyle; rostral prolongation long and slender, at base on outer face with a low common tubercle, from summit of which arise two relatively short, straight spines, these shorter than the prolongation distad of tubercle. Gonapopyses with mesal-apical lobe a short curved black spine, the tip acute.

Habitat.—Dominica.

Holotype, ♂, Layou River, on Hatton Garden, altitude 2,000 feet, August 16, 1938 (Hodge).

Limonia (Geranomyia) microphaea is somewhat similar to *L. (G.) cerberus* Alexander and *L. (G.) fluxa* Alexander, differing especially in the small size, uniformly dark brown mesonotum, and structure of the male hypopygium.

Limonia (Geranomyia) plumbeipleura Alexander.

Dominica: Sylvania Estate, altitude 1,800 feet, August 28–30, 1938 (Hodge). Formerly known from northern South America and Trinidad.

Limonia *(Geranomyia)* **sylvania** sp. n.

Allied to *plumbeipleura;* size small (wing, ♂, under 6 mm.); mesonotum buffy brown, with three brown praescutal stripes; femora obscure yellow, with a narrow brown subterminal ring; wings yellow, patterned with brown, the dark area at origin of *Rs* also involving the fork of *Sc;* abdominal segments dimidiate, the bases darkened, the apices yellow; male hypopygium with the spines of the rostral prolongation of ventral dististyle arising from tubercles that are much shorter than the spines themselves; mesal-apical lobe of gonapophysis a short blackened horn.

Male.—Length, excluding rostrum, about 4.6–5 mm.; wing 5.4–5.8 mm.; rostrum about 2 mm.

Rostrum black, relatively short. Antennae black throughout. Head black, the median region of vertex lined with light gray.

Mesonotum obscure buffy brown, with three distinct but somewhat poorly delimited brown stripes; scutum buffy brown, the lobes variegated with darker brown; posterior sclerites of notum chiefly darkened. Pleura with propleura obscure yellow; dorsal mesopleura and pleurotergite weakly darkened, the sternopleurite and meron yellow. Halteres obscure yellow, the base of stem a little brighter. Legs with the coxae and trochanters yellow; femora obscure yellow, with a narrow brown subterminal ring, the yellow apex beyond slightly wider; in cases, the femora are darker, more brownish yellow, and the subterminal dark ring is preceded by a narrow, clearer yellow annulus; tibiae and tarsi yellow, the outer tarsal segments darkened. Wings yellow, more saturated in the costal and prearcular fields, the apex, in cases, weakly darkened; a sparse brown pattern, including four subcostal areas that are more restricted than the interspaces; first area above arculus, tending to become evanescent; second area at supernumerary crossvein in cell *Sc;* third area large, irregular in outline, common to the origin of *Rs* and fork of *Sc;* fourth area largest, at stigma; narrower brown seams along cord, outer end of

cell *1st* M_2 and on distal portion of vein *2nd A;* veins yellow, darker in the infuscated areas. Venation: *Sc* relatively short, Sc_1 ending a short distance beyond origin of *Rs*, at about opposite one-fifth the length of this vein; *m-cu* at fork of *M*.

Abdomen more or less dimidiate, the bases of the segments narrowly darkened, the apices more extensively yellow; subterminal segments uniformly darkened; hypopygium yellow. Male hypopygium (Fig. 16) with the caudal margin of tergite broadly and conspicuously emarginate, the margins of the lobes broadly thickened and sclerotized; tergal setae coarser and more sparse than in *plumbeipleura*. Dorsal dististyle a curved sickle. Ventral dististyle large and fleshy, the rostral prolongation and spines much as in *plumbeipleura;* rostrum nearly parallel-sided, scarcely expanded outwardly; spines equal in size, the tubercle of the lower or more cephalic spine shorter, less than half the spine; both tubercles much shorter than the spines they bear, the outer being about two-thirds its spine. Gonapophyses with mesal-apical lobe appearing as a short blackened horn.

Habitat.—Dominica.

Holotype, ♂, Sylvania Estate, altitude 1,800 feet, August 28, 1938 (Hodge). Paratopotype, ♂.

Although allied to *Limonia (Geranomyia) plumbeipleura* Alexander (Dominica and Trinidad; northern South America) and to *L. (G.) marthae* Alexander (Mt. Santa Marta, Colombia), the present fly is distinct in the characters listed in the diagnosis. The size and the general structure of the male hypopygium is more as in *marthae* but the coloration of the legs and details of the hypopygium in the latter, especially the very large ventral dististyle and its rostral spines, indicate a distinct species. All three forms constitute a group of closely interrelated flies.

Limonia (Geranomyia) tibialis (Loew).

Dominica: Sylvania Estate, altitude 1,800 feet, August 30, 1938 (Hodge).

Polymera *(Polymera)* **albitarsis dominicae** subsp. n.

Male.—Length about 4.5 mm.; wing 5.2 mm.; antennae about 6 mm.

Differs from typical *albitaris* Williston (St. Vincent), as follows:

Size small. Mesonotum uniformly dark brown, only the humeral region and pretergites restrictedly obscure yellow. Pleura chiefly

covered by a very broad, black stripe, only the stenopleurite and ventral meron abruptly yellow. Legs with fore coxae blackened on basal two-thirds, the apex and remaining coxae light yellow; femora brown, passing into dark brown, the tips abruptly whitened; tibiae dark brown; outer tarsal segments whitened, in degree less than in typical *albitarsis*, the proximal half of the second tarsal segment of posterior leg darkened; in *albitarsis*, on the posterior legs, only the basitarsi are darkened. Wings very strongly suffused with brown; veins darker. Venation: *Sc* short, Sc_1 ending opposite fork of the short *Rs*; $R_2 + _3 + _4$ long, nearly straight, fully as long as *Rs* and nearly twice $R_2 + _3$; $R_1 + _2$ and $R_2 + _3$ subequal.

Habitat.—Dominica.

Holotype, ♂, Sylvania Estate, altitude 1,800 feet, August 30, 1938 (Hodge).

Rhabdomastix fumipennis sp. n.

General coloration brownish black, the thorax unpatterned; antennae black; halteres and legs brownish black; wings with a strong brown suffusion; stigma ill-defined, very slightly darker than the ground; *Rs* approximately twice $R_2 + _3 + _4$; abdomen black.

Female.—Length about 5.5–6.5 mm.; wing 4.5–5 mm.

Rostrum and palpi brownish black. Antennae black throughout, of moderate length (female), if bent backward scarcely attaining the wing-root; flagellar segments subcylindrical. Head blackish.

Thorax uniformly brownish black, without markings. Halteres brownish black, the extreme base of stem pale. Legs with the coxae brownish black; trochanters testaceous; remainder of legs brownish black, the subterminal tarsal segments a little paler. Wings (Fig. 9) broad, with a strong brown suffusion; stigma ill-defined, very slightly darker brown than the ground; veins brown. Wing-veins chiefly naked; a series of trichia on outer ends of veins R_5, $M_1 + _2$ and M_3; in cases, a single or very sparse trichia on M_4 and distal section of Cu_1. Venation: *Rs* considerably longer than in *parvula*, a little more than twice $R_2 + _3 + _4$; R_4 slihtly variable in length, subequal to or shorter than $R_2 + _3 + _4$.

Abdomen black. Valves of ovipositor, especially the cerci, elongate and very slender.

Habitat.—Dominica.

Holotype, ♂, Sylvania Estate, altitude 1,800 feet, August 29, 1938 (Hodge). Paratopotypes, 7 ♀♀.

Rhabdomastix fumipennis seems undoubtedly to be closed to *R. parvula* Alexander (*parva* Alexander, preoccupied), which belongs to the subgenus *Sacandaga* Alexander. In the absence of the male sex of the present fly, it seems inadvisable to refer it to a given subgenus since the antennae are short in the females in both of the regional subgenera; the males of *Rhabdomastix* Skuse, s. s., have the antennae much longer than the body, of *Sacandaga*, short as in the females. From *parvula*, the present fly differs most evidently in the broad wings with the venational details distinct, notably the long *Rs*.

Erioptera (Mesocyphona) caloptera Say

Dominica: Sylvania Estate, altitude 1,800 feet, August 29, 1938 (Hodge).

Toxorhina *(Toxorhina)* **fumipennis** sp. n.

General coloration of mesonotum dark brown, the lateral borders of praescutum broadly buffy gray; halteres and legs dark brown; wings with a strong brown suffusion, the veins darker; veins $M_3 + _4$ and M_4 subequal; *m-cu* about one-third its length before fork of *M*.

Female.—Length, excluding rostrum, about 7 mm.; wing 5.2 mm.

Rostrum black, its apex broken. Head dark gray.

Cervical region and pronotum blackened. Mesonotal praescutum with disk brown, the lateral margins broadly buffy gray; posterior sclerites of notum dark, sparsely pruinose. Pleura with central portion chiefly infuscated, paler dorsally and ventrally. Halteres dark brown. Legs dark brown. Wings with a strong brown suffusion, unpatterned; veins darker than the ground. Venation: Sc_1 ending opposite origin of *Rs*, Sc_2 near its tip; basal section of $M_1 + _2$ about two-thirds the second; $M_3 + _4$ subequal to M_4 alone; *m-cu* about one-third its length before fork of *M*.

Abdominal tergites brownish black, sparsely pruinose; sternites paler.

Habitat.—Dominica.

Holotype, ♂, Sylvania Estate, altitude 1,800 feet, August 25, 1938 (Hodge).

The strongly infumed wings of the present species readily distinguish it from all other members of the genus so far described in the Neotropical fauna.

II. Tipulidae from the Greater Antillean Islands. Descriptions of new species and records of distribution from Cuba, Hispaniola, Jamaica and Puerto Rico.

Tipula darlingtoniana sp. n.

Size large (wing, ♂, over 25 mm.); mesonotum buffy, with four entire brown stripes, the interspaces with brown setigerous punctures; antennae yellow; legs with femora obscure brownish yellow, the tips blackened; wings whitish subhyaline, patterned with various shades of brown; *Rs* long, about three times *m-cu;* abdominal tergites buffy, quadrivittate with brown; cerci long, slender, straight.

Female.—Length about 31 mm.; wing 26 mm.

Frontal prolongation of head brownish gray above, brown on sides and beneath; nasus long and slender; palpi black, the apices of the intermediate segments narrowly yellow. Antennae yellow; first flagellar segment longer than the scape; verticils of intermediate segments exceeding the segments in length. Head grayish brown, with a narrow, dark brown, median vitta on posterior vertex; vertical tubercle relatively low.

Pronotum buffy, with three brown areas, the interspaces with brown setigerous punctures. Mesonotal praescutum buffy, with four entire dark brown stripes, the intermediate pair contiguous or narrowly confluent at ends, the median portion a little infuscated and lined centrally with darker, humera region of praescutum extensively dark brown; interspaces with conspicuous brown setigerous punctures; scutal lobes brownish gray, narrowly darker brown on mesal edge; median region of praescutum gray, with a capillary darker vitta; scutellum whitish gray, with a median brown vitta, parascutella dark; mediotergite gray, the central fourth whitish gray, bordered sublaterally by dark brown. Pleura brownish gray, clearer gray on ventral sclerites, sparsely variegated with brown on dorsal anepisternum and sternopleurite, and, especially, on the pleurotergite. Halteres with stem yellow, knob infuscated. Legs with the coxae gray, with brown punctures; trochanters obscure yellow; femora obscure brownish yellow, the tips rather narrowly blackened; tibiae obscure yellow, the tips passing into black; first and second tarsal segments obscure yellow, the tips darkened; remainder of tarsi black. Wings whitish subhyaline, conspicuously patterned with various shades of brown; prearcular field chiefly darkened, its outer end white; cell *C* uniformly brown except at outer end; cell *Sc* brownish yellow, with four major areas that extend into cell *R*, these

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pale brown, bordered posteriorly by darker brown; outer radial field pale brown, bordered behind by a dark brown seam on outer two-thirds of vein $R_4 + _5$; basal two-thirds and outer end of cell *M* brown, the latter area paler, the cubital veins narrowly bordered by dark brown; outer portions of Anal cells pale brown; cell *Cu* and basal third cell *1st* A washed with darker brown; restricted darker brown seams at outer end of cell *1st* $M_1 + _2$, *m-cu* and veins at base of cell *1st* M_2, and on vein *2nd A;* veins brown, a little paler in the ground areas. Venation: Distal half of vein $R_1 + _2$ pale but preserved; *Rs* very long, about three times as long as *m-cu;* petiole of cell M_1 longer than *m*; basal section M_4 erect, exceeding $M_3 + _4$.

Abdominal tergites with the ground color buffy, variegated by two submedian dark stripes that are separated by a capillary median ground vitta; additional sublateral brown stripes, the interspaces with brown setigerous punctures; sternites chiefly dark brown, variegated by buffy. Ovipositor with long slender straight cerci; hypovalvae stouter.

Habitat.—Dominican Republic.

Holotype, ♂, Valle Nuevo, southeast of Constanza, altitude about 7,000 feet, August 1938 (Darlington).

I take very great pleasure in naming this striking and distinct fly in honor of the collector, Dr. P. J. Darlington, Jr., who has added so materially to our knowledge of the Tipulidae of Hispaniola. The species appears to belong to the *glaphyroptera* group of the genus, including a vast aggregation of South and Middle American forms, but not previously known from the West Indian islands. It is amply distinct from all other known species, especially in the coloration of the antennae, mesonotum, legs and wings.

Tipula (Yamatotipula) ludoviciana Alexander.

Cuba: Santiago de las Vegas, March 31, 1931 (A. Otero); April 20, 1931 (A. Cremata).

Nephrotoma circumscripta (Loew).

Cuba: Pico Turquino, Oriente altitude 5,000 feet, June 1936 (Julián Acuna).

Nephrotoma glabricristata sp. n.

Allied to *ferruginea;* basal three antennal segments yellow, the succeeding segments varying from uniformly black to weakly bicolorous; mesonotal praescutum yellow with three more nacreous stripes that are very narrowly bordered in part by dark brown;

mediotergite with a brown central stripe on anterior half; wings narrow, with a faint brown tinge, the stigma and costal border darker; wing-tip and seams along veins darkened; a few macrotrichia in outer end of cell R_3; abdomen orange, sparsely patterned with darker; male hypopygium with the dorsal crest of the inner dististyle high and entirely glabrous.

Male.—Length about 10 mm.; wing 9.5–10 mm.; antennae about 3.3 mm.

Female.—Length about 15 mm.; wing 11–11.5 mm.

Frontal prolongation of head polished yellow; nasus distinct; palpi yellow, the terminal segment a little darker. Antennae relatively short; basal three segments yellow, succeeding segments varying from uniform black to weakly bicolored, with the basal enlargement of the segment blackened, the apex paler (this latter condition in holotype); flagellar segments rather strongly incised. Head orange; occipital brand of moderate size, elongate oval, with the anterior end pointed, poorly defined.

Pronotum darkened laterally, clear light yellow medially above. Mesonotal praescutum yellow, with three more nacreous stripes that are very narrowly bordered by dark brown; on the lateral stripes this border is restricted to inner margin; lateral stripes straight, without clearly defined marginal marking opposite anterior end; scutum yellow, each lobe entirely traversed by posterior extensions of the lateral praescutal stripes, these not margined with darker; scutellum darkened, parascutella pale; mediotergite yellow, with a brown central stripe that is narrowed or obliterated on posterior half, posterior border of sclerite narrowly darkened. Pleura yellow, variegated with reddish brown, especially on propleura and on ventral anepisternum, sternopleurite, meron and pleurotergite. Halteres with stem obscure yellow, knob infuscated. Legs with the coxae reddish yellow; trochanters yellow; femora yellow, the tips very narrowly blackened; tibiae pale yellowish brown, passing into dark brown; tarsi black. Wings narrow, with a faint brown tinge; cell *Sc* and stigma brown, cell *C* and prearcular field more yellowish brown; wing-tip and very narrow seams along cord brown; a brown seam along vein *Cu;* veins dark brown, narrowly and vaguely seamed with brown. A few macrotrichia in outer end of cell R_5, with a few others at proximal end of stigma. Venation: Sc_2 ending opposite origin of the short oblique *Rs*, the latter in virtual alignment with $R_4 + _5$; cell M_1 narrowly sessile.

Abdomen orange, both tergites and sternites with a faint dusky median spot shortly before apex; hypopygium orange. Male hypopygium of the general type of *ferruginea;* inner dististyle with the dorsal crest unusually high and entirely glabrous; in *ferruginea,* the entire margin is provided with abundant short setae.

Habitat.—Cuba, Hispaniola.

Holotype, ♂, Loma del Gato, Sierra del Cobre, Oriente, Cuba, altitude about 3,000 feet, July 3–7, 1936 (Darlington). Allotopotype, ♀, Buenos Aires, Santa Clara, Cuba, July 19, 1932 (Bates & Fairchild). Paratopotype, ♂; paratypes, 1 ♂, 2 ♀ ♀, with allotype, July 19–20, 1932; ♂ ♀, Kenskoff, near Port-au-Prince, Haiti, altitude 4,000–6,000 feet, September 2, 1934 (Darlington); La Visite and vicinity, La Selle Range, Haiti, altitude 5,000–7,000 feet, September 16–23, 1934 (Bates); Loma Rucilla, Dominican Republic, altitude 5,000–10,000 feet, June 8, 1938 (Darlington).

Nephrotoma glabricristata is closest to *N. ferruginea* (Fabricius) and allies, especially to the southern Nearctic *N. ferruginea suturalis* (Loew). It differs especially in the coloration, narrow wings, and structure of the male hypopygium, as above described. I had earlier (Journ. Dept. Agr. Puerto Rico, 16:378; 1932) recorded this species as a variety of *ferruginea* but with the present abundant material it appears to be quite distinct. In the Hispaniolan material, there is a slight modification of the praescutal pattern as above described. The margins of the central praescutal stripe and the mesal edge of each lateral stripe in cases with anterior ends outcurved towards margin but entirely polished and not differentiated in color from remainder of stripe.

Megistocera longipennis (Macquart).

Cuba: Santiago de las Vegas, May 22, 1931, October 3, 1929 (Otero); July 12, 1930 (Bruner).

Brachypremna unicolor Osten Sacken.

Cuba: San Blas, Santa Clara, Trinidad Mountains, altitude 700 feet, July 26; December 23, 1931 (Rowe).

Puerto Rico: One ♂, without further data, ex Winthem Collection in the Vienna Museum.

Dolichopeza (Megistomastix) devexa Alexander.

Cuba: North side of the Pico Turquino, Sierra Maestra, Oriente, altitude 4,500–6,000 feet, June 18–20, 1936 (Darlington).

Dolichopeza *(Megistomastix)* **darlingtoni** sp. n.

General coloration dark brown, the praescutum more reddish brown; antennae (male) short, less than one-half the length of body, verticils short; legs black, the femoral bases narrowly yellow; wings strongly darkened, the stigma dark brown; abundant macrotrichia in cells of outer three-fourths of wing; abdominal segments weakly bicolored, yellowish brown, the incisures narrowly blackened; male hypopygium with eighth sternite produced into a long median lobe that terminates in a trident of black spines; median area of ninth tergite somewhat similarly produced into a long lobe bearing coarse setae; outer dististyle with the outer lobe narrow.

Male.—Length about 10 mm.; wing 9.5 mm.; antennae about 4 mm.

Frontal prolongation of head short, black; palpi black. Antennae black, the pedicel obscure yellow; flagellum relatively short, less than one-half the length of body; segments cylindrical, with verticils that are shorter than the segments; pubescence of segments short and inconspicuous. Head brownish black, the anterior vertex paler, relatively narrow, less than two times the diameter of scape.

Mesonotal praescutum almost uniformly dark reddish brown, with indications of a median and shorter lateral brown stripes; humeral and lateral portions of praescutum more blackened; posterior sclerites of notum dark brown, the median region of scutum and scutellum a little paler; mediotergite and pleurotergite more reddish brown. Pleura brownish black. Halteres with stem and apex of knob obscure yellow, base of knob weakly darkened. Legs with coxae dark brown; trochanters yellow; remainder of legs black, the femoral bases very narrowly yellow. Wings strongly darkened, especially the costal border and outer radial field; stigma darker brown; veins and trichia brownish black. Macrotrichia of cells abundant, including all but the basal fourth of wing and involving the distal half of cell *2nd A*. Venation: $R_1 + _2$ preserved as a weak spur; petiole of cell M_1 a little shorter than *m;* cell *1st* M_2 long and narrow, a trifle widened outwardly but still approximately parallel-sided.

Abdominal segments weakly bicolored, yellowish brown, the incisures narrowly blackened, involving both the apices and bases of the individual segments; hypopygium darkened. Male hypopygium (Fig. 11) with the eighth sternite, *8s,* produced into an elongate median lobe that is tipped with three conspicuous black spinous setae. Ninth tergite, *9t,* somewhat similarly produced into a long median lobe that is a little expanded at distal end and provided with

long coarse setae; lateral tergal lobes low, with a close group of about a dozen setae. Basistyle, *b*, produced into a conspicuous lobe that bears numerous short black spines at apex, with a few longer spines along mesal face. Outer dististyle, *od* more elongate than in *devexa*, especially the narrow outer lobe, the inner mesal lobe slender, provided with blackened setae. Beak of inner dististyle, *id*, small.

Habitat.—Cuba (Oriente).

Holotype, ♂, Pico Turquino, Sierra Maestra, north side, altitude 4,500–6,000 feet, June 18–20, 1936 (Darlington).

Named in honor of the collector, Dr. P. J. Darlington, Jr. The nearest ally is *Dolichopeza (Megistomastix) devexa* Alexander, which is well-distinguished by the elongate antennae that are more than twice as long as in the present fly. The structure of the male hypopygium differs in all details. The somewhat remarkable lobe of the eighth sternite of the present fly is represented in *devexa* by a smaller pale unarmed lobe.

Dolichopeza *(Megistomastix)* **domingensis** sp. n.

General coloration dark gray; antennae relatively short, black, with inconspicuous verticils and pubescence; pleura variegated yellow and brownish black; halteres black; legs black, the femoral bases restrictedly obscure yellow; wings strongly infuscated, the stigma darkened; certain of the veins seamed with brown; obliterative areas at cord conspicuous; macrotrichia of cells abundant, present on distal three-fourths of wing; $R_1 + _2$ entire; cell M_1 sessile; abdominal tergites black, the lateral margins obscure yellow; male hypopygium with the inner dististyle unusually broad, its apex obtuse; eighth sternite with the median lobe low and obtuse, without modified spines or setae.

Male.—Length about 9 mm.; wing 10.8 mm.; antennae about 3.6 mm.

Rostrum obscure brownish yellow; palpi black. Antennae relatively short, black, the pedicel a little brightened; flagellar segments subcylindrical, the verticils much shorter than the segments, pubescence short. Head dark brown.

Pronotum dark brown. Pretergites and humeral region of praescutum restrictedly pale. Disk of praescutum covered by confluent dark gray stripes, obliterating the interspaces and restricting the brownish black ground to the lateral borders; scutal lobes dark gray, slightly variegated by blackish, the median area narrowly pale; scutellum polished black, the parascutella pale, slightly marked with

darker; mediotergite brown, more blackened laterally. Pleura yellow, variegated with brownish black areas, especially on the propleura and anepisternum and again on the ventral sternopleurite and meron; a dark spot on ventral pleurotergite. Halteres black, the base of stem restrictedly yellow. Legs with coxae and trochanters yellowish testaceous; remainder of legs black, the femoral bases restrictedly obscure yellow. Wings (Fig. 2) strongly infuscated, the stigma darker; cells *C* and *Sc*, together with a seam on *m-cu*, a little darker than the ground; conspicuous whitish obliterative areas before stigma and especially across bases of cells *1st* M_2 and M_3; veins beyond cord and tip of *2nd A* rather insensibly seamed with darker; veins and trichia dark brown. Macrotrichia of cells abundant, including virtually the whole wing with the exception of the proximal fourth (represented in figure by stippling); in the outer cells where the veins are seamed with darker, the trichia are more restricted to the centers of the cells. Venation: $R_1 + _2$ entire; *Rs* short, oblique, subequal to basal section of $R_4 + _5$; cell M_1 broadly sessile.

Abdomen with tergites black, paling to obscure yellow on sides; sternites chiefly yellow, the incisures darkened, more especially involving the bases of the segments. Male hypopygium (Fig. 12) with lobe of eighth sternite, *8s*, very low and broad, provided only with normal setae. Caudal margin of ninth tergite, *9t*, generally transverse to very feebly emarginate, with abundant coarse black setae. Region of basistyle, *b*, with coarse black spines that are continued based on the face of style. Outer dististyle, *od*, scarcely modified. Inner dististyle, id, with the blade very broad, the apex obtuse.

Habitat.—Dominican Republic.

Holotype, ♂, Loma Rucilla, altitude 5,000–10,000 feet, June 1938 (Darlington).

Dolichopeza (Megistomastix) domingensis is so distinct from the other described species of the subgenus that it requires little comparison. It is the only species having vein $R_1 + _2$ entire and cell M_1 sessile. The structure of the male hypopygium is somewhat unusually generalized. The subgenus *Megistomastix* had not hitherto been recorded from Hispaniola though represented by somewhat numerous species in Puerto Rico and Cuba.

Limonia (Discobola) gowdeyi (Alexander).

Cuba: San Blas, Santa Clara, Trinidad Mountains, altitude 700 feet, July 1926, December 4, 1931 (Rowe). Pico Turquino, Sierra Maestra, Oriente, south side, altitude 3,000–5,000 feet, June 1936 (Darlington).

Limonia (Limonia) hoffmani Alexander.

Puerto Rico: El Semille, Villalba, altitude 1,600 feet, at light, January 26, 1935 (W. A. Hoffman).

Limonia (Limonia) umbrata (de Meijere).

Dicranomyia umbrata de Meijere, Tijd. voor Ent., 54; 25–26; 1911.

Limonia fissilis Alexander, Ann. Ent. Soc. America, 19:159; 1926.

Widely distributed in eastern Asia. Apparently introduced by commerce into the Neotropical Region. The type-locality of *fissilis* is Vera Cruz, Mexico.

Cuba: Sierra Rangel, Pinar del Río, altitude 1,500 feet, 1936 (Brother Chrysogone, Colegio de la Salle, Havana).

Limonia *(Limonia)* **domballah** sp. n.

General coloration of mesonotum black, the praescutum more obscure yellow and castaneous; pleura black; knobs of halteres yellow; femora yellow, narrowly ringed with black before tips; wings yellow, patterned with brown; *Rs* angulated and spurred at origin; abdominal segments black, the caudal borders narrowly yellow.

Female.—Length about 10 mm.; wing 10 mm.

Rostrum and palpi black. Antennae black throughout; flagellar segments oval, with very short apical necks; longest verticils a little exceeding the segments. Head with the front and narrow anterior vertex gray; remainder of vertex and the occiput black. the orbits weakly dusted with gray.

Pronotum black medially above, obscure yellow on sides. Mesonotal praescutum polished obscure yellow, more castaneous behind, with three black stripes, the median one intense only on cephalic portion, becoming obsolete at or before midlength of sclerite; lateral stripes appearing as major areas on sides of praescutum, crossing the dorsopleural region and becoming confluent with the blackened pleura; scutal lobes black, the median area brownish yellow; scutellum and postnotum shiny black. Pleura and pleurotergite uniformly black. Halteres with base of stem and the knob obscure yellow, the distal portion of stem infuscated. Legs with the coxae yellow, the fore coxae a trifle darkened on anterior face; trochanters yellow; femora yellow, with a narrow black subterminal ring that is a little wider than the yellow apex; tibiae yellowish brown, the tips narrowly

darkened; remainder of legs black. Wings (Fig. 3) yellow, with a conspicuous brown pattern, as follows: Extensive washes in basal cells from *Sc* to margin in cell *2nd A*, at origin of *Rs*, cord and outer end of cell *1st* M_2; stigma oval, darker brown; wing-tip weakly infumed; veins brown. Venation: Sc_1 ending about opposite four-fifths the length of *Rs*, Sc_2 at its tip; a short spur of R_{1+2}; *Rs* angulated and spurred at origin; free tip of Sc_2 and R_2 in transverse alignment; inner end of cell R_3 lying far proximad of either cell R_5 or *1st* M_2; cell *1st* M_2 subequal in length to vein M_3 beyond it; *m-cu* a short distance before fork of *M;* cell *2nd A* wide.

Abdominal tergites black, the caudal borders of the segments narrowly ringed with yellow, on the subterminal segments uniformly blackened; basal sternites obscure yellow, the remaining segments patterned as on the tergites. Ovipositor with the cerci relatively small and slender, gently upcurved to the acute tips.

Habitat.—Dominican Republic.

Holotype, ♂, Loma Rucilla and mountains to north, altitude 5,000–8,000 feet, June 1938 (Darlington).

The name, *Domballah,* is that of the Father of the Gods of the Voodoos in Hispaniola. The species is very distinct from all described regional species, especially in the uniformly blackened pleura and in the pattern of the wings.

Limonia *(Dicranomyia)* **calliergon** sp. n.

General coloration gray, variegated with black; cephalic half of mesonotal praescutum uniformly brownish gray, the posterior half clearer gray, with four distinct black stripes; knobs of halteres black; legs black, the femoral bases yellow, broadest on fore legs; tips of all femora narrowly whitish yellow; wings whitish subhyaline, reticulately patterned with dark brown; a complete white crossband before cord; *m-cu* oblique, before the fork of *M,* longer than the distal section of Cu_1; abdomen yellow; male hypopygium with two rostral spines from a single common tubercle.

Male.—Length about 6–6.5 mm.; wing 6.4–7 mm.

Female.—Length about 7–7.5 mm.; wing 7.5–8 mm.

Rostrum and palpi black, the former a little pruinose. Antennae with scape black, pruinose; pedicel obscure yellow; basal flagellar segments brownish yellow, the outer segments passing into black; flagellar segments oval. Head black, variegated with silvery, on the anterior vertex a little more golden pollinose.

Mesonotal praescutum gray, the cephalic half more uniformly brownish gray, unstriped; on posterior half with four clearly defined black stripes, the intermediate pair not reaching the suture, the laterals fused with the dark lateral margin, crossing the suture and suffusing most of the scutal lobes; median area of scutum and the scutellum broadly light gray, parascutella dark; mediotergite chiefly blackened, variegated with gray on sides; lateral borders of pronotum and praescutum blackened. Pleura gray, variegated with velvety black, especially on anepisternum, dorsal pteropleurite and pleurotergite. Halteres with stem pale yellow, knob black. Legs with fore coxae blackened, remaining coxae more pruinose; trochanters brown; femora black, the bases light yellow, more extensively so on fore legs where about the basal third is included, less so on the middle and posterior legs where only about the proximal eighth is involved; tips of all femora narrowly but very conspicuously whitish yellow, the amount subequal on all legs; remainder of legs black. Wings with the ground color whitish subhyaline, handsomely patterned with dark brown on cephalic portion and more grayish brown behind; pattern more or less reticulate, with a complete white crossband before cord; before the cord with from nine to twelve costal dark rays, cell *Sc* uniformly darkened; in cell *R* at base, before mid-distance to origin of *Rs* and at the origin of the latter with dark lines that reach vein *M* behind or virtually so; beyond the cord and stigma a similar muscoid pattern that sends about four or five rays to costal border at stigma and about three or four others to above the termination of vein R_3, these latter areas extensively darkened and fused behind in the proximal portion of the outer radial field; posterior cells of wing more sparsely reticulate with grayish brown, chiefly evident as marginal rays in all the cells; cells adjoining vein *Cu* slightly suffused with brown; prearcular field slightly more yellow; veins pale, darker in the patterned areas. Venation: *Rs* angulated and more or less spurred at origin; Sc_1 extending a short distance beyond origin of *Rs* to near one-fourth the length, Sc_2 close to tip; cell *1st* M_2 relatively large, longer than any of the veins beyond it; *m-cu* oblique, before the fork of *M*, longer than the distal section of Cu_1; cell *2nd A* wide.

Abdomen conspicuously pale yellow; in cases, the subterminal segments more weakly infuscated; hypopygium yellow. Male hypopygium with the tergite transverse, the caudal margin gently emarginate. Dorsal dististyle a gently curved sickle, the long drawn tip acute. Ventral dististyle fleshy, a little larger than the basistyle;

rostral prolongation stout, on outer margin beyond midlength with a single tubercle that bears two subequal spines, these latter about twice as long as the tubercle. Gonapophyses with mesal-apical lobe stout, with a coarsely and irregularly serrated lateral flange.

Habitat.—Haiti.

Holotype, ♂, La Visite and vicinity, La Selle Range, altitude 5,000–7,000 feet, September 16–23, 1934 (Bates). Allotopotype, ♀. Paratopotypes, 10 ♂ ♀.

A very distinct species, superficially resembling species like *Limonia (Dicranomyia)* reticulata (Alexander) or *L. (D.) pampoecila* (Alexander), yet entirely distinct. I am placing it in the subgenus *Dicranomyia* despite the fact that Sc_1 ends a short distance beyond the origin of *Rs*, as in *Limonia*, s.s.

Limonia *(Dicranomyia)* calliergon polygrapha subsp. n.

Male.—Length about 6 mm.; wing 7 mm.

Close to typical *calliergon*, differing as follows:

Scutellum with darkened extensions from the scutal lobes, on either side of median line. Femora more extensively yellow, with moderately broad, black, nearly terminal rings; tibiae yellow, the bases narrowly black, the tips and all tarsi broken. All legs of the unique type are detached and thus cannot be safely associated with any given trochanter. Wings with the dark reticulate pattern much more extensive, the costal rays narrow and entire; cells *R* and *M* with darkened areas, as in the other cells; white crossband before cord narrower and less evident; veins dark, including those in the ground areas, and therefore much more distinct. Male hypopygium with the ventral dististyle smaller than in the typical form, the rostral spines arising from a similar conspicuous basal tubercle but unequal in length, the outer about three-fourths the length of the inner and closely applied to it.

Habitat.—Dominican Republic.

Holotype, ♂, Valle Nuevo, southeast of Constanza, altitude about 7,000 feet, August 1938 (Darlington).

Although the coloration of the thorax and general pattern of the wings is very similar in the two forms, the differences in the color of the legs and wings, and the nature of the rostral spines of the male hypopygium, in the present fly, incline me to believe that it may be found to represent a valid species rather than a subspecies.

Limonia (Dicranomyia) reticulata (Alexander).

Cuba: San Blas, Santa Clara, Trinidad Mountains, August 12, 1932 (Bates & Fairchild). Sierra Rangel, Pinar del Río, January 27–30, 1931 (Acuña & Otero).

Limonia *(Dicranomyia)* indefensa sp. n.

General coloration medium brown, the praescutum unpatterned; antennae black throughout; halteres black, the base of stem yellow; legs dark brown, the femoral tips not brightened; wings with a brown tinge, the oval stigma darker brown; vague brown seams along cord and outer end of cell *1st* M_2; abdominal tergites dark brown, the sternites weakly bicolored, reddish brown, the outer half of the segments darker.

Female.—Length about 9 mm.; wing 9.3 mm.

Rostrum and palpi black throughout; flagellar segments long-oval. Head black; anterior vertex about equal in width to the diameter of the scape.

Pronotum brown. Mesothorax almost uniformly medium brown, without markings, the pleura scarcely paler. Halteres black, base of stem pale. Legs with the coxae pale brown; trochanters greenish testaceous; remainder of legs dark brown, the femoral tips not brightened. Wings with a brown tinge, the oval stigma darker brown; paler brown, poorly defined seams on cord and outer end of cell *1st* M_2; veins pale brown. Venation: Sc_1 ending just beyond origin of *Rs*, Sc_2 shortly before this point; free tip of Sc_2 and R_2 in transverse alignment; cell *1st* M_2 subequal in length to the longest veins beyond it; *m-cu* close to fork of *M*.

Abdominal tergites dark brown; sternites weakly bicolored, reddish brown basally, the outer half of each segment somewhat darker. Ovipositor with cerci slender, very gently upcurved.

Habitat.—Haiti.

Holotype, ♀, La Visite, La Selle Range, altitude 5,000–7,000 feet, September 16–23, 1934 (Bates).

Limonia (Dicranomyia) indefensa is quite distinct from the other regional species of the subgenus. It is apparently closest to *L. (D.) humidicola* (Osten Sacken) and allies, differing in the coloration of the body and wings, and in the uniformly darkened femora.

Limonia (Dicranomyia) divisa Alexander.

Haiti: La Visite and vicinity, La Selle Range, altitude 5,000–7,000 feet, September 16–23, 1934 (Bates).

Puerto Rico: El Semille, Villalba, altitude 1,600 feet, at light January 26, 1935 (W. A. Hoffman).

Limonia (Neolimnobia) diva (Schiner), var.

Cuba: Sierra Rangel, Pinar del Río, January 27–30, 1931 (Acuña & Otero).

Limonia (Rhipidia) schwarzi (Alexander).

Cuba: Sierra Rangel, Pinar del Río, January 27–30, 1931 (Acuña & Otero).

Jamaica: Balaclava (A. E. Wight).

Limonia (Rhipidia) domestica (Osten Sacken).

Cuba: San José, July 7 (at light). Santiago de las Vegas, April 7, 1930 (Otero). San Blas, Santa Clara, Trinidad Mts., altitude 700 feet, January 1, 1932 (Rowe). Sierra Rangel, Pinar del Río, January 27–30, 1931 (Acuña & Otero).

Puerto Rico: El Semille, Villalba, altitude 1,600 feet, at light, January 26, 1935 (Hoffman).

Jamaica: Balaclava; Moneague, February 2–3 (W. S. Brooks). Port Antonio, (A. E. Wight).

Limonia (Geranomyia) antillarum Alexander.

Cuba: Buenos Aires, Santa Clara, Trinidad Mountains, May 14, 1932 (Acuña).

Puerto Rico: El Semille, Villalba, altitude 1,600 feet, at light, January 26, 1935 (Hoffman).

Limonia (Geranomyia) myersiana Alexander.

Cuba: San Blas, Santa Clara, Trinidad Mountains, altitude 700 feet, December 4, 1931 (Rowe). Sierra Rangel, Pinar del Río, January 27–30, 1931 (Acuña & Otero).

Puerto Rico. El Semille, Villalba, altitude 1,600 feet, at light, January 26, 1935 (Hoffman).

Limonia (Geranomyia) tibialis (Loew).

Cuba: San Blas, Santa Clara, July 20, 1932 (Bates & Fairchild). Sierra Rangel, Pinar del Río, January 27–30, 1931 (Acuña & Otero).

Puerto Rico: El Semille, Villalba, altitude 1,600 feet, at light, January 26, 1935 (Hoffman).

Jamaica: Balaclava (A. E. Wight). Port Antonio (A. E. Wight).

In the Port Antonio specimen the praescutal stripes are obsolete or nearly so, but the identity seems certain. Whether the species is the same as the earlier *L. (G.) intermedia* (Walker) remains in question yet is entirely possible.

Limonia *(Geranomyia)* **banksiana** sp. n.

Allied to *canadensis;* general coloration of praescutum medium brown, without stripes; scutellum brown, with a vague central paler area; mediotergite dark brown, the apical portion yellow; legs brown; wings subhyaline, unmarked except for the oval, pale brown stigma; Sc_1 ending about opposite midlength of *Rs;* *r-m* greatly reduced by the approximation of veins R_4+_5 and M_1+_2; male hypopygium with the lobes of ninth tergite rounded, provided with conspicuous setae, the extensive median area glabrous; ventral dististyle large and fleshy; rostral prolongation short, with two subequal spines arising from very unequal tubercles, the shortest one close to apex of prolongation; mesal-apical lobe of gonapohysis entirely pale, simple, nearly straight.

Male.—Length, excluding rostrum, about 6 mm.; wing 6.4 mm.; rostrum approximately 2.6 mm.

Rostrum relatively long, brown, the tips of paraglossae darker brown. Antennae dark brown, the scape a little paler brown. Head grayish brown; anterior vertex narrow, subequal to diameter of scape.

Mesonotal praescutum medium brown, without stripes; humeral region a little more yellowish; scutal lobes pale brown, the median area pale yellow; scutellum brown, with a vague central paler area; mediotergite dark brown, with less than the apical half yellow. Pleura brownish yellow, unmarked. Halteres pale. Legs with the coxae and trochanters obscure yellow, the fore coxae a trifle darker; remainder of legs pale brown, the terminal tarsal segments dark brown. Wings, subhyaline, the oval stigma pale brown; veins brown. Numerous macrotrichia on veins beyond cord, as well as a complete series on *Rs.* Venation: *Sc* relatively long, Sc_1 ending about opposite midlength of *Rs*, Sc_2 a short distance from its tip; *r-m* greatly reduced by the approximation of veins R_4+_5 and M_1+_2; *m-cu* close to fork of *M*; cell *2nd A* relatively narrow.

Basal abdominal segments brown, the outer segments somewhat more bicolored, darker brown at apex than at base; hypopygium dark. Male hypopygium (Fig. 14) with the outer angles of ninth

tergite, *9t*, produced into rounded lobes that are provided with conspicuous setae, the extensive intermediate area glabrous. Ventromesal lobe of basistyle large. Ventral dististyle, *vd*, large and fleshy, much more extensive than the basistyle; rostral prolongation short, with two spines arising from unequal tubercles; outer spine placed very close to apex of prolongation on a low tubercle; second spine subequal in length, arising a little farther basad and from a much longer tubercle that exceeds one-third the length of spine. Mesal-apical lobe of gonapophysis, *g*, entirely pale, simple, nearly straight.

Habitat.—Cuba.

Holotype, ♂, Soledad, near Cienfuegos, August 6, 1920 (Banks).

I take very great pleasure in naming this fly in honor of the collector, Dr. Nathan Banks, to whom I am greatly indebted for many appreciated favors. Although generally similar in its general appearance to *Limonia (Geranomyia) canadensis* (Westwood), the present fly is very distinct in the structure of the male hypopygium.

Limonia (Geranomyia) subvirescens Alexander.

Cuba: Loma de la Sierra, Santiago de las Vegas, March 5, 1931 (Acuña & Otero).

Limonia ***(Geranomyia)*** **subvirescens jamaicae** subsp. n.

Male.—Length, excluding rostrum, about 5 mm.; wing 5 mm.; rostrum about 3 mm.

Female.—Length, excluding rostrum, about 6 mm.; wing 5.8 mm.; rostrum about 3 mm.

Rostrum pale yellowish brown, the tips of the paraglossae strongly recurved. Antennae dark brown throughout; flagellar segments oval. Head dark brown.

Thorax uniform orange yellow, unmarked. Halteres pale. Legs yellow throughout. Wings pale yellow, the subcircular stigma pale brown; veins brownish yellow. Venation: *Sc* moderately long, Sc_1 ending about opposite two-thirds the length of *Rs*, Sc_2 at its tip; *Rs* about twice the basal section of $R_4 + _5$; *m-cu* at fork of *M*; cell *2nd A* relatively narrow.

Abdomen yellow. Male hypopygium much as in typical *subvirescens* Alexander (Cuba) but apex of rostral prolongation of ventral dististyle much more slender, the diameter at this point only about one-third the length of the rostral spines. In *subvirescens*, the transverse diameter beyond the rostral spines is more than one-half the length of the spines.

Habitat.—Jamaica.

Holotype, ♀, Port Antonio (A. E. Wight). Allotopotype, ♂, in poor condition.

In typical *subvirescens*, the wings are subhyaline, with the brown veins much more distinct.

Limonia (Geranomyia) virescens (Loew).

Puerto Rico: El Semille, Villalba, altitude 1,600 feet, at light, January 26, 1935 (Hoffman).

Orimarga (Diotrepha) mirabilis (Osten Sacken).

Cuba: Santo Tomás, Province of Zapata, May 5–9, 1927 (Acuña & Bruner).

Helius (Helius) albitarsis (Osten Sacken).

Cuba: Sierra Rangel, Pinar del Río, altitude 1,500 feet, April 26, 1933 (Bruner & Otero); January 27–30, 1931 (Acuña & Otero).

Ephiphragma (Epiphragma) cubensis Alexander

Cuba: Sierra Rangel, Pinar del Río, January 27–30, 1931 (Acuña & Otero).

Epiphragma *(Epiphragma)* **auricosta** sp. n.

General coloration brown and yellow; antennae (male) short, black; first flagellar segment yellow; femora yellow, with three black rings; tibiae chiefly dark brown to black, the tarsi paling to obscure yelow; wings yellow, the cephalic third more saturated, butter-yellow, with an ocelliform pattern.

Male.—Length about 9–10 mm.; wing 11–12 mm.; antennae about 2.3–2.4 mm.

Female.—Length about 12–13 mm.; wing 11.5–12 mm.

Rostrum dark brown; palpi black. Antennae short, black, the basal segment of flagellum yellow; flagellar verticils exceeding the segments in length. Head chestnut brown, with a dark brown transverse band across anterior vertex and a less distinct median darkening on posterior vertex; posterior portions of vertex more or less white pruinose.

Pronotum dark brown, more yellowish on sides. Mesonotal praescutum with the ground color reddish brown, with three conspicuous, dark brown stripes on cephalic half, on posterior half becoming obscured and confluent, more uniformly dark brown; humeral regions

of praescutum restrictedly pale, more extensively bordered internally by dark brown, the lateral margins behind the pseudosutural foveae broadly dark brown; in still other specimens, the color of the praescutum varies from uniform dark brown to striped with dark throughout the length; scutum chiefly brownish yellow, contrasting abruptly with the praescutum; scutellum and postnotum dark colored, light gray pruinose, the mediotergite and pleurotergite with their posterior borders broadly dark brown. Pleura with the propleura and pleurotergite chiefly dark brown, the mesopleura almost uniformly pale. Halteres elongate, stem obscure yellow, knob brown. Legs with the coxae obscure brownish yellow; trochanters yellow; femora yellow, with three black rings, the last terminal, the median one about twice as wide as the yellow ring on either side; basal dark ring narrow and somewhat paler; tibiae dark brown to black, in cases the extreme tips reddish; basitarsi dark brown, remainder of tarsi paling to obscure brownish yellow. Wings with the ground color yellow, the cephalic third more saturated butter-yellow; a conspicuous, chiefly ocelliform, dark pattern, including ocelli beyond arculus, origin of *Rs*, cord, outer end of cell *1st* M_2 and fork of *M*; in region of stigma, several small, more blackish areas; a solidly darkened mark in cells *Cu*, *1st A* and *2nd A*, in alignment with the ocellate area at origin of *Rs;* areas in cell *2nd A* about three in number, the intermediate ones in cases interconnected; veins brown, more yellowish in the costal interspaces. Venation: *m-cu* not more than its own length beyond the fork of *M*.

Abdominal tergites dark brown, the caudal margins broadly more grayish; sternites and hypopygium more yellow to brownish yellow. Male hypopygium with the lobes of the tergite obtusely rounded, separated by a deep linear notch. Interbases with short triangular apical points.

Habitat.—Dominican Republic.

Holotype, ♂, Valle Nuevo, southeast of Constanza, altitude about 7,000 feet, August 1938 (Darlington). Allotopotype, ♀. Paratopotype, 1 ♀; paratypes, 1 sex?, Foothills of the Cordillera Central, south of Santiago, June 1938; 1 ♂, Loma Rucilla, altitude 8,000-10,000 feet, June 1938 (Darlington).

Epiphragma (Epiphragma) auricosta is very different from the three other species known from the Greater Antilles, especially in the strongly yellow wings and the pattern of the legs, as the three-banded femora and darkened tibiae.

Epiphragma (Epiphragma) buscki Alexander.

Haiti: Desbarriere, Mt. La Hotte, altitude about 4,000 feet, October 12–14, 1934 (Darlington).

Epiphragma *(Epiphragma)* **inornatipes** sp. n.

General coloration of praescutum brownish yellow, the cephalic fourth darkened, the remainder with narrow brown stripes; pleura gray pruinose, the dorsopleural region and membrane dark brown; femora almost uniformly brown, the tips narrowly pale, tibiae and tarsi yellow; wings whitish subhyaline, patterned with brown, much as in *solatrix*; dark areas in outer radial field large and full, dark areas in cell *2nd A* very extensive, involving the central portion of cell; male hypopygium with the inner dististyle relatively narrow, with conspicuous setae.

Male.—Length about 11.5 mm.; wing 12.3 mm.

Rostrum brown; palpi black. Antennae with scape and pedicel black, flagellum broken. Head chiefly brown, the posterior orbits more grayish; anterior vertex behind antennae more blackened.

Pronotum light brown, narrowly blackened medially, more broadly so on sides. Mesonotal praescutum with cephalic fourth almost uniformly darkened, the remainder more brownish yellow with four narrow brown stripes that do not reach the suture behind, the lateral pair much reduced; lateral borders of praescutum behind pseudosutural fovea more uniformly darkened, the suture bordered by brown; scutum with cephalic half buff, the posterior half almost covered by a transverse brown band; scutellum buffy; mediotergite pale, the posterior third and a narrow transverse line at near midlength darker brown. Pleura chiefly gray pruinose, variegated with brownish black, especially on dorsal pleurites and the dorsopleural region. Halteres with stem yellow, knob more or less darkened, the apex narrowly pale. Legs with the coxae gray, the extreme base of fore pair darkened; trochanters yellow; femora almost uniform brown, paler basally, the apex narrowly pale; tibiae and tarsi yellow. Wings whitish subhyaline, heavily patterned with brown, the areas of cephalic and apical portions paler brown with narrow dark borders; in Anal field, the areas uniformly dark brown; stigma narrow, almost uniformly dark brown; wing pattern somewhat as in *solatrix* yet differing in certain important points; dark areas in cell *C* more extensive than the interspaces; marginal areas in outer radial field large and full; dark areas in cell *2nd A* very extensive, involving the central portion of cell.

Abdominal segments variegated dark and paler brown, the lateral borders buffy. Male hypopygium with the outer dististyle relatively narrow, the tip decurved; inner dististyle narrower than in *solatrix*, provided with conspicuous setae. Interbases with apical spines recurved.

Habitat.—Cuba.

Holotype, ♂, Pico Turquino, Sierra Maestra, Oriente, north side, altitude 4,500–6,000 feet, June 18–20, 1936 (Darlington).

Epiphragma (Epiphragma) inornatipes is apparently closest to the smaller *E. (E.) solatrix* (Osten Sacken), having the pattern of the femora virtually the same. It differs in the coloration of the body and wings, and in the details of structure of the male hypopygium.

Shannonomyia batesi sp. n.

Belongs to the *mesophragma* group; mesonotum gray; halteres pale yellow; femora yellow with a brownish black subterminal ring, on fore and middle femora with the basal third or more similarly blackened; wings yellow, spotted and dotted with brown; cell *1st* M_2 closed, elongate, with *m-cu* at near one-third the length.

Male.—Length about 5.5–6 mm.; wing 6–6.5 mm.

Female.—Length about 7.5–8 mm.; wing 6.5–7 mm.

Rostrum and palpi black. Antennae yellow, the outer flagellar segments infuscated; in darker individuals the antennae are more uniformly brown throughout; flagellar segments oval. Head gray.

Mesonotum gray, the praescutum with a slightly darker gray median stripe, the scutal lobes similarly darkened. Pleura black, gray pruinose. Halteres pale yellow throughout. Legs with the coxae black, pruinose; trochanters yellow; femora yellow, with a conspicuous, dark brown to brownish black ring before the subequal or narrower yellow apex; fore and middle femora with the basal third or more similarly blackened, leaving only a relatively narrow, obscure yellow ring between the two dark bands; posterior femora less distinctly or not at all darkened at base; tibiae and tarsi yellow, the tips of the latter darkened. The females seem to have darker legs than the males and at least one specimen has the fore and middle femora uniformly blackened with the exception of the narrow yellow bases; hind femora less evidently blackened except at tips; in all cases the fore and middle femora are more extensively blackened than are the posterior femora. Wings (Fig. 4) with the ground color yellow, the prearcular and costal fields a little deeper yellow to brownish yellow; a heavy spotted and dotted brown pattern, the

largest areas at stigma, more or less confluent with a seam along cord; smaller brown spots at origin of *Rs*, supernumerary crossvein in cell *R*, *m-cu* and outer ends of veins R_3 and R_4; small brown marginal spots at ends of longitudinal veins, usually more extensive at *2nd A;* numerous to somewhat sparse brown dots in most cells of wing; veins yellow, darker in the clouded areas. Venation: Sc_1 ending at near two-thirds the length of *Rs*, Sc_2 near its tip; a supernumerary crossvein in *cell R* connecting with *Rs* about its own length beyond origin; *r-m* strongly bowed; cell *1st* M_2 closed, elongate, longer than any of the veins beyond it; *m-cu* at near one-third the length; basal section of M_3 variable in length, from short and nearly straight to arcuated or even feebly angulated.

Abdomen black, sparsely pruinose; hypopygium reddish brown.

Habitat.—Haiti.

Holotype, ♂, La Visite and vicinity, La Selle Range, altitude 5,000–7,000 feet, September 16–23, 1934 (Bates). Allotopotype, ♀. Paratopotypes, 9 ♂ ♀.

I take great pleasure in naming this very distinct fly in honor of the collector, Mr. Marston Bates. The species and the two next described are the first species of the genus to be discovered in Hispaniola. By my key to the Cuban members of the genus (Journ. Agr. Univ. Puerto Rico, 21:526–527; 1937), the present fly runs to *Shannonomyia phragmophora* Alexander. It differs from all three Cuban members of the group in the numerous dots in the cells of the wings and in the heavy dark pattern of the femora.

Shannonomyia haitensis sp. n.

General coloration gray, the praescutum with vaguely darker stripes; basal three antennal segments yellow, the remainder black; head and pronotum clear light gray; legs yellow; wings whitish subhyaline, conspicuously patterned with brown, the areas confined to the vicinity of the veins; *Rs* relatively short, angulated at origin; R_2 some distance before fork of cell R_3; vein R_4 strongly upcurved at tip; *r-m* strongly bowed; cell *1st* M_2 elongate.

Male.—Length about 5–5.5 mm.; wing 5–6 mm.

Female.—Length about 6.5–7 mm.; wing 5.5–6.5 mm.

Rostrum gray; palpi black. Antennae short; basal three segments yellow, the remainder of flagellum black; flageller segments oval, much longer than the segments. Head light gray; anterior vertex relatively wide, exceeding two times the diameter of scape.

Pronotum clear light gray; lateral pretergites similarly clear gray. Mesonotal praescutum light gray to brownish gray, with three darker gray stripes; scutal lobes similarly darkened; scutellum gray, with a capillary brown median vitta; mediotergite gray pruinose. Pleura gray, somewhat variegated with darker gray, especially dorsally and on ventral sternopleurite. Halteres pale yellow. Legs with the coxae yellow, fore coxae a trifle darker; trochanters yellow; remainder of legs yellow, the outer tarsal segments a trifle darker. Wings (Fig. 5) whitish subhyaline, with a conspicuous pattern that is confined to the vicinity of the veins, arranged as follows: Arculus; origin of *Rs;* fork of *Sc;* stigma; cord and outer end of cell *1st* M_2; marginal spots at ends of all longitudinal veins, smallest on R_5, largest on *2nd A;* in cases, dark clouds at fork of R_{2+3+4} and at intervals along distal section of M_{1+2}; veins yellow, darker in the clouded areas. Venation: *Rs* relatively short, angulated and, in cases, short-spurred at origin; Sc_1 ending at or beyond three-fourths the length of *Rs;* R_2 some distance before fork of cell R_3; vein R_4, and usually R_3 also, strongly upcurved at tip; *r-m* very strongly bowed; cell *1st* M_2 elongate, subequal to or longer than vein M_{1+2} beyond it; *m-cu* at from one-third to near one-half the length of the cell.

Abdomen dark brown, including the hypopygium.

Habitat.—Haiti.

Holotype, ♂, La Visite and vicinity, La Selle Range, altitude 5,000–7,000 feet, September 16–23, 1934 (Bates). Allotopotype, ♀. Paratopotypes, 6 ♂ ♀.

Shannonomyia haitensis is very different from the described Cuban and Puerto Rican species of the genus. It is perhaps closest to *S. brevicula* Alexander, of Cuba, differing notably in the pattern and venation of the wings.

Shannonomyia septem-punctata sp. n.

General coloration pale yellow, including the antennal flagellum, halteres and legs; wings yellow, with seven conspicuous brown spots; *Rs* unusually long, exceeding vein R_4, angulated and short-spurred at origin; R_2 shortly before fork of cell R_3; *m-cu* shortly before midlength of the long cell *1st* M_2.

Female.—Length about 6.5 mm.; wing 6.2 mm.

Rostrum and palpi brown. Antennae short; scape brown; succeeding segments pale, the outer ones a little darker; flagellar segments oval. Head brownish yellow to pale brown, darker anteriorly.

Thorax uniformly pale yellow, virtually unmarked; central portion of scutum and adjoining median portion of praescutum somewhat clearer yellow; scutellum and mediotergite with a vague darker median vitta. Halteres pale yellow. Legs yellow, the terminal tarsal segments darkened. Wings (Fig. 6) yellow, the prearcular and costal portions a trifle more saturated yellow; seven conspicuous brown spots, as follows: At arculus; origin of *Rs;* stigma; basal section of R_5; remainder of anterior cord at end of vein *M;* outer end of cell *1st* M_2; *m-cu;* veins yellow, darker in the clouded areas. Venation: *Rs* unusually long, exceeding vein R_4, angulated and short-spurred at origin; R_2 subequal to $R_1 + _2$, placed just before fork of cell R_3; *r-m* arcuated, lying proximad of vein R_5; cell *1st* M_2 elongate, subequal to the veins beyond it, with *m-cu* shortly before midlength.

Abdomen obscure yellow, the incisures of the more basal tergites a little darker. Ovipositor with unusually long and slender valves, especially the cerci.

Habitat.—Dominican Republic.

Holotype, ♂, Valle Nuevo, southeast of Constanza, altitude about 7,000 feet, August 1938 (Darlington).

Shannonomyia septem-punctata is quite distinct from all other species known from the Neotropics. The almost uniformly yellow color, conspicuously patterned wings and unusually long *Rs* will suffice for the recognition of the fly.

Hexatoma (Eriocera) bruneri (Alexander).

Cuba: Coast below Pico Turquino, Oriente, June 26–30, 1936 (Darlington). Near Santiago, September 4, 1928 (Bruner).

The first specimen listed, as well as the holotype specimen, shows a crossvein in cell *Sc* beyond the origin of *Rs,* this being lacking in the second specimen above listed and evidently not entirely constant.

Hexatoma (Eriocera) cubensis (Alexander).

The female had not been described.

Female.—Length about 18 mm.; wing 15 mm.; antennae about 3 mm.

Characters as in male, differing in the sexual characters. Antennae 9-segmented. Ovipositor with the valves very long and slender, especially the cerci.

Allotype, ♀, Buenos Aires, Trinidad Mountains, Cuba, altitude 2,500–3,500 feet, May 8–14, 1936 (Darlington).

The type males had been taken in the same locality at a somewhat lower level (altitude 1,600 feet, March 24, 1925, J. G. Myers).

Hexatoma (Eriocera) juliana Alexander.

The allotopotype and paratopotype were added to the original definition (Journ. Agr. Univ. Puerto Rico, 21: 529–530; 1937) while the paper was in proof but no further data could be supplied at that time. The paratype were taken on the north side of the Pico Turquino, altitude 4,500–6,000 feet, June 18–20, 1936; the allotype at the summit, altitude 6,000 feet, June 16–21, 1936, all secured by Mr. Darlington. These specimens are smaller than the type (Male.—Length about 12 mm.; wing 12.5–13.5 mm. Female.—Length about 17 mm.; wing 15 mm.) but otherwise conform in all essential features. The antennae of the male are 8-segmented.

Hexatoma *(Eriocera)* **ornaticornis** sp. n.

Mesonotal praescutum reddish brown with four clearly defined dark brown stripes; antennae 7-segmented, basal four segments and apical third of last segment black, the remainder yellow; posterior sclerites of notum and the pleura dark brown to brownish black; halteres with brownish black knobs; femora yellow, the tips blackened; wings whitish hyaline, heavily patterned with dark brown, the areas in part ocelliform; margin of wing narrowly darkened; *Rs* in alignment with R_5, the basal section of the latter short; $R_2 + _3$ short, only a little more than one-half $R_2 + _3 + _4$ and subequal to $R_1 + _2$; *m-cu* at near one-third the length of cell *1st* M_2; basal abdominal segments yellow, darkened outwardly, the distal segments, including hypopygium, brownish black.

Male.—Length about 14 mm.; wing 11.7 mm.; antennae about 2.4 mm.

Rostrum black, sparsely pruinose; palpi black. Antennae 7-segmented; scape, pedicel, basal two flagellar segments except at incisures and distal third of terminal segment black, the remainder abruptly yellow; basal two flagellar segments more incrassated than the three outer ones; three outer flagellar segments long-cylindrical, subequal in length. Head gray; vertical tubercle moderately developed, low, on its central portion further produced into a small lobule.

Pronotum dark brown. Mesonotal praescutum reddish brown, with four clearly defined but narrow dark brown stripes, the intermediate pair ending before the suture, the lateral pair a trifle wider,

crossing the suture onto the scutal lobes; median region of scutum paler; scutellum testaceous brown, the parascutella darker; mediotergite testaceous brown, darker laterally, the pleurotergite more uniformly darkened. Pleura brownish black. Halteres with stem yellow, knob brownish black. Legs with coxae brownish blackened trochanters yellow; femora yellow, the tips conspicuosly blackened (about 1 mm. or a little more); tibiae yellow, the tips brownish black; basitarsi brownish yellow, the tips and remainder of tarsi blackened. Wings (Fig. 7) with the ground color whitish hyaline, heavily patterned with dark brown, the pattern with more or less distinct ocelli at origin of *Rs*, cord and outer end of cell *1st* M_2; two dark costal areas at end of *Sc* and at stigma, converging behind and uniting with darkening at cord; cell *C* dark brown, alternating with four smaller more yellow spots; a narrow but conspicuous brown margin from beyond stigma almost to wing-base in cell *2nd A;* a semicircular brown area across bases of cells *R* and *M* beyond arculus; brown washes in basal portions of outer radial field and in cells *M*, *Cu*, *1st A* and *2nd A;* veins brown. Numerous macrotrichia on veins beyond cord. Venation: *Rs* longer than in *acuñai*, in alignment with R_5, the basal section of latter very short to virtually lacking; R_{2+3} short, only a little more than one-half R_{2+3+4} and subequal to R_{1+2}; cell R_3 much shorter than in *acuñai;* cell 1st M_2 relatively large, vein M_{1+2} beyond it about one-half longer than the cell; *m-cu* at near one-third the length of cell *1st* M_2, a little longer than the distal section of Cu_1. No supernumerary crossvein in cell R_4, as in *acuñai*.

Abdomen elongate; first tergite dark brown; second segment yellow, narrowly darkened laterally, the following segments more obscure; outer segments passing through dark brown to brownish black.

Habitat.—Cuba.

Holotype, ♂, Loma del Gato, Sierra del Cobre, Oriente, altitude about 3,000 feet, July 3–7, 1935 (Darlington).

The most similar species is *Hexatoma (Eriocera) acuñai* Alexander, of western Cuba, which, while having the wing-pattern somewhat similar, differs in all details of body coloration and venation.

Hexatoma *(Eriocera)* **multiguttula** sp. n.

Mesonotum dark brown, the lateral borders of praescutum very narrowly yellow; head gray, the posterior vertex with an extensive brown area; legs black, the tips of all tibiae and the entire tarsi paling to brownish yellow; wings saturated, with a conspicuous pat-

tern of sparse brown spots and abundant dots in all the cells; $R_2+_3+_4$ shorter than R_2+_3; *m-cu* far distad, its caudal end more proximad than its cephalic end.

Female.—Length about 17 mm.; wing 18 mm.

Rostrum black, gray pruinose; palpi black. Antennae (female) 9-segmented; scape and pedicel obscure yellow, sparsely pruinose above; basal two flagellar segments clear light yellow; succeeding four segments more infuscated, with their apices clearer yellow; terminal segment pale basally, the outer half darkened; first flagellar segment about one-half longer than the second; terminal segment one-third longer than the penultimate. Head light gray, the posterior vertex with an extensive brown central area; vertical tubercle low.

Pronotum light yellow, the color continued backward onto the extreme lateral border of praescutum and the dorsopleural membrane to the wing-root. Mesonotal praescutum, scutum and scutellum uniformly dark brown; mediotergite dark brown, the posterior and lateral borders a trifle pale, with a delicate pale median vitta. Pleura obscure yellow, the propleura and mesopleura somewhat infumed but not forming a stripe; ventral pleurites and pleurotergite clearer yellow. Halteres with stem obscure yellow, knob dark brown. Legs with the coxae and trochanters light yellow; femora entirely black; tibiae black, the tips paling to brown; tarsi brownish yellow. Wings saturated yellow, patterned with brown, including major areas at origin of *Rs*, R_2, anterior cord and tip of vein *Cu;* all cells with abundant small brown dots; veins yellow, darker in the major clouded areas. Venation: Sc_1 ending opposite fork of $R_2+_3+_4$; R_2 nearly as long as R_1+_2; $R_2+_3+_4$ shorter than R_2+_3 but longer than the basal section of R_5; cell *1st* M_2 long, *m* only about one-third as long as the basal section of M_3; *m-cu* far distad, nearly twice its length beyond the fork of *M*, about one-third longer than the distal section of Cu_1.

Abdominal tergites obscure yellow, more darkened medially, the extreme caudal borders of the intermediate segments yellow; sternites obscure yellow. Ovipositor with long slender cerci.

Habitat.—Dominican Republic.

Holotype, ♀, Valle Nuevo, southeast of Constanza, altitude about 7,000 feet, August 1938 (Darlington).

The only generally similar species is *Hexatoma (Eriocera) cramptoni* (Alexander), known only from the Blue Mountains, Jamaica. This differs most evidently in the pattern of the thorax, unbrightened tarsi and in the details of venation, especially in the medial field,

where *m* is only a little shorter than the basal section of M_3 and *m-cu* has a different course, with the caudal end lying more distad than the cephalic portion.

Hexatoma (Eriocera) trifasciata (Röder).

Puerto Rico: El Yunque, Luquillo National Forest, June 7–10, 1935 (García Díaz). Las Mesas, near Mayagüez, over quiet pool in small stream, altitude 900 feet, November 3, 1935 (A. H. Madden).

Teucholabis (Teucholabis) myersi Alexander.

Cuba: Sierra Rangel, Pinar del Río, January 27–30, 1931 (Acuña & Otero).

Teucholabis (Teucholabis) nigrosignata Alexander.

Cuba: Buenos Aires, Trinidad Mountains, altitude 2,350–2,800 feet, May 3, 1932 (Bruner & Otero). Baracoa, Oriente, April 21–30, 1929 (Bruner & Leon Bouclé).

Teucholabis (Teucholabis) portoricana Alexander.

Puerto Rico: el Semille, Villalba, altitude 1,600 feet, at light, January 26, 1935 (Hoffman).

Teucholabis *(Teucholabis)* wighti sp. n.

Size small (wing, ♂, under 5 mm.); general coloration yellow, the praescutum with three major polished black areas, pleura with a silvery longitudinal stripe; posterior tibiae of male with a narrow dilated ring at near three-fourths the length and a similar dilation near proximal end of posterior basitarsi; wings whitish subhyaline, the stigma and a confluent seam of cord brown; *Sc* short; R_2 interstitial with fork of *Rs;* branches of *Rs* strongly divergent; male hypopygium with apical spine of basistyle very small and weak; outer dististyle with a slender spine on mesal edge.

Male.—Length about 4.5 mm.; wing 4.8 mm.

Rostrum and palpi yellow. Antennae with scape and pedicel obscure brownish yellow, flagellum black; flagellar segments oval, decreasing in size outwardly; segments with short apical necks. Head yellow.

Pronotum yellow. Mesonotal praescutum with the ground reddish brown, with three major black areas, involving the cephalic and lateral portions of the sclerite, the latter reaching the lateral margin; scutum with lobes extensively blackened, the broad median area obscure yellow; scutellum broad, yellow, parascutella darkened; mediotergite

black, the central portion of anterior half a little paler. Pleura with the dorsal sclerites black, including the anepisternum, dorsal pteropleurite and pleurotergite; a conspicuous silvery longitudinal stripe extending from the fore coxae across the dorsal sternopleurite, ventral pteropleurite and meral region; ventral sternopleurite and dorsopleural membrane more yellowish. Halteres with stem darkened, knob light yellow. Legs with coxae and trochanters yellow; femora yellow, with a narrow brown subterminal ring, the narrow apex a trifle narrower, the darkened ring subequal in width on all legs; tibiae obscure yellow, in male with a slightly enlarged brown ring at near three-fourths the length, this provided with a group of setae; tarsi yellow, the outer segments more darkened, in male with a slightly enlarged and darkened ring near proximal end of basitarsi. Wings (Fig. 8) whitish subhyaline, the stigma and a narrow confluent seam on cord dark brown; veins pale brown. Venation: *Sc* relatively short, Sc_1 ending about opposite one-fifth the length of *Rs*; R_2 interstitial with cord, at end of *Rs*; anterior branch of *Rs* in direct alignment with the stem, the branches widely divergent so cell R_4 at margin is approximately twice as wide as cell R_2; cell *1st* M_2 closed, gently widened outwardly, shorter than vein M_{1+2} beyond it; *m-cu* shortly beyond fork of *M;* vein Cu_2 very short and pale, indicated only at base.

Abdominal tergites black, the incisures a little more reddish piceous; basal sternites yellow, transversely ringed at near midlength with dark brown; subterminal segments whitened; hypopygium abruptly black. Male hypopygium (Fig. 7) with the apical spine of basistyle, *b*, very short, weak and slender; dorsal flange long but only feebly sclerotized. Outer dististyle, *od*, with apical half a flattened blade, glabrous except on outer margin, constricted at its base and at this point on mesal edge produced into a slender spine. Crest of inner dististyle, id, high, the apex obtuse, the beak bidentate.

Habitat.—Jamaica.

Holotype, ♂, Balaclava (A. E. Wight).

Teucholabis (Teucholabis) wights is named in honor of the collector, who has taken many of the Jamaican Tipulidae now preserved in the Museau of Comparative Zoölogy. It is most nearly allied to the Cuban *T. (T.) nigrosignata* Alexander, differing especially in the narrow subterminal femoral rings, the wing pattern and venation, and the structure of the male hypopygium, especially the small weak apical spine of basistyle and the spine on mesal edge of the outer dististyle.

Gonomyia (Idiocera) angustissima Alexander.

Cuba: Soledad, April 1926 (Bequaert). San Blas, Santa Clara, Trinidad Mountains, altitude 700 feet, December 4, 1931 (Rowe).

Gonomyia (Lipophleps) bifiligera Alexander.

Puerto Rico: El Semille, Villalba, altitude 1,600 feet, at light, January 26, 1935 (Hoffman).

Gonomyia (Lipophleps) sandersi Alexander.

Cuba: Laguna Castellanos, Wojay, Havana, February 14, 1931 (Otero). The specimen, a male, has cell M_2 of both wings open by the atrophy of basal section of M_2.

Gonomyia (Lipophleps) pleuralis (Williston).

Cuba: Santiago de las Vegas, March 3, 1931 (Otero); July 12, 1930 (Bruner).

Gonomyia *(Lipophleps)* monacantha platymera subsp. n.

Male.—Length about 3.5 mm.; wing 3.8 mm.

Female.—Length about 5 mm.; wing 4.5 mm.

Differs from the typical form in the structure of the male hypopygium (Fig. 18). Outer spine of outer dististyle, *od,* much stouter than in either *monacanthia* or *helophila* Alexander, the apex blackened and microscopically roughened by appressed spinulae, smooth in the others; basal spine of outer dististyle a strongly blackened flange that extends into a strong spine, the outer margin of flange more or less irregularly serrate, the surface slightly scabrous. Inner dististyle, *id,* simple.

Habitat.—Cuba.

Holotype, ♂, Soledad, near Cienfuegos, August 6–20 (Banks).

Allotype, ♀, San Blas, Santa Clara, August 12, 1932 (Bates & Fairchild).

When more material becomes available, this fly will probably be accorded full specific ranking.

Erioptera (Mesocyphona) costalis Alexander.

Cuba: San Blas, Santa Clara, July 20—August 12, 1932 (Bates & Fairchild).

Erioptera (Trimicra) pilipes anomala (Osten Sacken).

Bermuda: Cavendish, January (W. S. Brooks). Swamp near Hamilton, December (W. S. Brooks).

Toxorhina (Toxorhina) domingensis Alexander.

Cuba: San Blas, Santa Clara, August 20, 1932 (Bates & Fairchild).

EXPLANATION OF FIGURES

(Symbols: Male hypopygium; *a*, aedeagus; *b*, basistyle; *d*, dististyle; *g*, gonapophysis; *id*, inner dististyle; *od*, outer dististyle; *s*, sternite; *t*, tergite; *vd*, ventral dististyle.)

Fig. 1.—**Tanypremna** *(Tanypremna)* **hodgei** sp. n., venation.
Fig. 2.—**Dolichopeza** *(Megistomastix)* **domingensis** sp. n., venation.
Fig. 3.—**Limonia** *(Limonia)* **domballah** sp. n., venation.
Fig. 4.—**Shannonomyia batesi** sp. n., venation.
Fig. 5.—**Shannonomyia haitensis** sp. n., venation.
Fig. 6.—**Shannonomyia septem-punctata** sp. n., venation.
Fig. 7.—**Hexatoma** *(Eriocera)* **ornaticornis** sp. n., venation.
Fig. 8.—**Teucholabis** *(Teucholabis)* **wighti** sp. n., venation.
Fig. 9.—**Rhabdomastix fumipennis** sp. n., venation.
Fig. 10.—**Tanypremna** *(Tanypremna)* **hodgei** sp. n., male hypopygium.
Fig. 11.—**Dolichopeza** *(Megistomastix)* **darlingtoni** sp. n., male hypopygium.
Fig. 12.—**Dolichopeza** *(Megistomastix)* **domingensis** sp. n., male hypopygium.
Fig. 13.—**Limonia** *(Limonia)* **apicata dominicensis** subsp. n., male hypopygium.
Fig. 14.—**Limonia** *(Geranomyia)* **banksiana** sp. n., male hypopygium.
Fig. 15.—**Limonia** *(Geranomyia)* **microphaea** sp. n., male hypopygium.
Fig. 16.—**Limonia** *(Geranomyia)* **sylvania** sp. n., male hypopygium.
Fig. 17.—**Teucholabis** *(Teucholabis)* **wighti** sp. n., male hypopygium.
Fig. 18.—**Gonomyia** *(Lipophleps)* **monacantha platymera** subsp. n., male hypopygium.

PLATE I

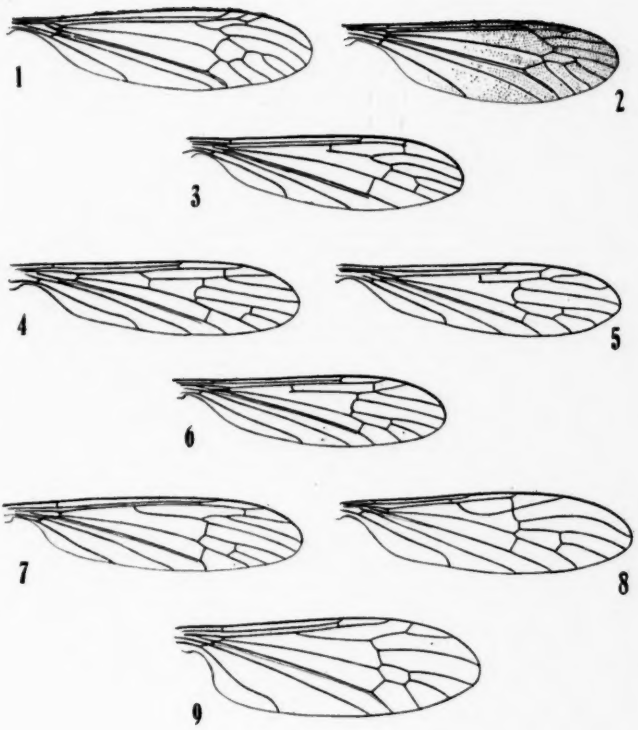

PLATE II

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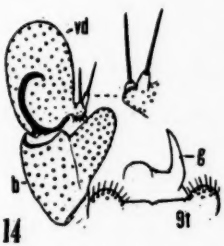

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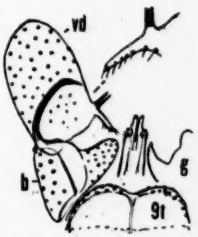

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